

104

OSHA FALL PROTECTION STANDARD

Y 4. SM 1: 104-33

OSHA Fall Protection Standard, Seri...

HEARING

BEFORE THE

SUBCOMMITTEE ON REGULATION AND PAPERWORK

OF THE

COMMITTEE ON SMALL BUSINESS

HOUSE OF REPRESENTATIVES

ONE HUNDRED FOURTH CONGRESS

FIRST SESSION

WASHINGTON, DC, JUNE 15, 1995

Printed for the use of the Committee on Small Business

Serial No. 104-33



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OSHA FALL PROTECTION STANDARD

THURSDAY, JUNE 15, 1995

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON REGULATION AND PAPERWORK,
COMMITTEE ON SMALL BUSINESS,
Washington, DC.

The subcommittee met, pursuant to notice, at 11:10 a.m., in room 2359-A, Rayburn House Office Building, Hon. James M. Talent, (chairman of the subcommittee) presiding.

Chairman TALENT. I call the subcommittee to order. We are running a little late, and I apologize for that. I do not like to keep witnesses sitting around. We will try to avoid that.

I have got an opening statement and then I will yield to the Ranking Member for any comments she may have. I want to begin this morning. I would like to thank those who traveled from across this country in order to give us an outside-the-beltway perspective on the issue.

I also want to thank the Assistant Secretary of Labor, the Honorable Joseph Dear, for agreeing to participate in the morning's discussion. We have a full agenda this morning. I am going to ask each of the witnesses, if possible, to keep your oral remarks as close to 5 minutes as you can, with the understanding that your full testimony will appear in the record.

The purpose of this morning's hearing is to give those concerned with OSHA's new fall protection standard and the subcommittee an opportunity to discuss this rule's impact on small businesses. This hearing is by no means meant to minimize the risks associated with the construction and roofing industries. Those risks are real, and both the construction, manufacturing, and roofing contractors and the Roofers Union have pledged to support efforts that will assist in the reduction of injury and illness in the industry.

Almost 8 years ago OSHA published a Notice of Proposed Rule-making concerning fall protection standards. At that time OSHA stated that it believed many of the existing provisions relating to fall protection were redundant or ambiguous and that by clarifying these problems it would increase compliance and reduce injuries.

In addition, OSHA stated that its data indicated falls and accidents at construction sites appeared to be primarily the result of noncompliance with existing OSHA standards and not because the standards themselves improperly addressed the hazards.

OSHA's final rule published in the "Federal Register" on August 9, 1994, states that review of accident data indicate that compliance with existing standards would have, in general, prevented the mishaps. The question of lowering the fall protection threshold

from 16 to 6 feet was not incorporated into the text of the original Notice of Proposed Rulemaking, but was raised only as 1 of 27 questions for public comment.

When the new 6-foot standard went into effect on February 6th of this year, it raised many questions among affected industries. For example, it is unclear how lowering the fall protection standard from 16 to 6 feet will increase compliance with fall protection regulations, which was OSHA's original objective when it published its Notice of Proposed Rulemaking in 1986.

It is also unclear how OSHA arrived at the 6-foot standard and why it believes that the 6-foot standard is more appropriate than a 7-foot or a 10-foot standard, as has been advocated by several industry associations and unions.

Furthermore, while the final rule makes reference to Bureau of Labor Statistics studies on the incidence of injuries and deaths resulting from falls, it is unclear what statistical data lead OSHA to select the 6-foot standard over other height standards.

Finally, OSHA's regulatory impact analysis raises several troubling questions, many of which have become all too familiar among small businesses who must comply with an increasing number of Federal regulations. According to the Regulatory Impact Analysis, which was published as part of the final rule, OSHA believes that the new 6-foot standard will not have a significant impact on a substantial number of small entities and would cost only about \$40 million annually.

Industry representatives dispute this estimate. They believe that compliance with the new regulation will cost approximately \$500 per worker. This estimate includes the cost of providing the required fall protection gear and training for its workers, but does not include the cost of regular inspections and replacement of lost or broken equipment. By multiplying \$500 by the 200,000 workers covered under the new regulations in the roofing industry alone, one clearly arrives at a figure higher than \$40 million.

In addition, because the regulations require an individual, site-specific, fall protection safety plan in those cases where the traditional fall protection equipment is not feasible, the paperwork burdens would appear to be significant.

Finally, since even the largest companies in the roofing industry average just 35 employees, it is difficult to understand how OSHA could come to the determination that the new rule would have a minimal effect on small entities. There are many other issues and questions that I have not raised that many other members of the subcommittee, if they arrive, may want to raise them.

Since time is short, I will at this time recognize the Ranking Member of the subcommittee, my distinguished colleague, Ms. Velázquez, for any remarks she may have.

Ms. VELÁZQUEZ. Thank you, Mr. Chairman.

Let me start out by welcoming Assistant Secretary Dear, and by thanking him for taking time out of his busy schedule to be here with us this morning.

Let me also commend you, Mr. Chairman, for putting together this hearing on the fall protection standard of the Occupational Safety and Health Act. As you know, I am not exactly shy when it comes to insuring the safety of this country's workers.

It should come as no surprise that I pay attention when I hear the National Institute for Occupational Safety and Health say that every year 100,000 workers are injured as a result of falls at construction sites.

About 150 to 200 workers die every year from these injuries. That is the tragic reality, Mr. Chairman. This hearing should be about accepting the responsibility to insure the safety of our workers. I urge every member of this subcommittee to keep that in mind.

I have reviewed the written testimony submitted by today's witnesses, and I must say that I am somewhat puzzled by some of their claims that OSHA did not keep their concerns in mind in the drafting of this rule.

I have gone over this regulation's final draft, as published in the August 9th edition of the "Federal Register of 1994," and it is my understanding that it was both nearly 9 years in the making, and that OSHA offered more than adequate time for the submission of comments by the affected parties.

I also understand that in developing this rule OSHA fully considered cost concerns, and that it has invited contractors to offer alternative methods of compliance.

With unanimous consent, I would like to introduce "OSHA's Regulatory Impact Statement" into the record.

[OSHA's statement may be found in the appendix.]

Mr. Chairman, I thank you once again and I look forward to the testimony of today's witnesses.

Chairman TALENT. I thank the gentlelady. Without objection, that will be entered into the record. I also have a statement from Mr. Roth of Wisconsin that he wanted to submit for the record, and I will have that inserted into the record without objection.

Mr. Dear, would you please approach? You are the first panel. I, again, want to welcome you and thank you for taking the time to prepare your testimony and to be here today. I know you are busy man, and we do appreciate it very much.

**TESTIMONY OF HON. JOSEPH DEAR, ASSISTANT SECRETARY
AND DIRECTOR, OCCUPATIONAL SAFETY AND HEALTH AD-
MINISTRATION, U.S. DEPARTMENT OF LABOR**

Mr. DEAR. Thank you very much, Madam Chairman, and members of the subcommittee. I appreciate this opportunity to discuss the Occupational Safety and Health Administration's revised fall protection standard, particularly as it affects the residential construction industry, and I am happy to discuss this with you.

Before I get to the specific standard, let me make just a couple of general observations about OSHA. We all need to understand the importance of workplace safety and health, and everybody is for that.

OSHA's mission to save lives, prevent injuries, and protect the health of America's workers, is just as important today as it was 24 years ago when it began operation. That does not mean OSHA has to conduct business the same way it did over that 24-year period. The question is how we can reform or reinvent OSHA to make it more effective, without rolling back the protections that 95 million working men and women in this country depend on.

We have three initiatives to accomplish that. They were announced by the President in May and incorporate: First, changing OSHA's paradigm from command and control regulation to partnership, offering employers a clear choice between a traditional enforcement relationship, if that is what they choose, or a partnership.

This means recognition that employers who implement safety and health programs, involve their workers, find and fix real hazards, and succeed in reducing injury and illness deserve a different, a better kind of treatment than employers who choose not to do that.

This is a program we have some experience with in the State of Maine, where we have conducted experiments and in the construction industry, where we have a program called Focused Inspection in Construction. It says if a contractor has an effective safety and health program, and there is an OSHA-compliance inspection, that inspection will be concentrated on the four hazards responsible for most of the fatalities to construction workers.

The second element of our strategy is bringing common sense to regulation, to change our approach from dictating regulations to negotiating and discussing them, to revise and fix out-of-date standards, to eliminate duplicative standards, and to the best of our ability rewrite our standards so that they are in plain English.

We have already begun this work at the request of the President in his page-by-page review, and we are committed to carrying out the commitments we made to the President in that effort.

The third part of our reinvention effort involves how OSHA works day to day, changing the focus of OSHA from red tape to results. We have in the past measured our activities in terms of the number of inspections we conduct, how many violations we find per inspection, how many penalty dollars we collect, which are important things to know about. However, OSHA was created to help prevent injury, illness, and death. We need to think about our activities in terms of results.

We are changing our goals. This year, there is no inspection number that we are trying to reach as a target. We are not evaluating our managers or our front-line workers on that basis. We are working to develop a real performance measurement system. That will take some time, but the Government Performance and Results Act is helping us move in a direction toward a results-oriented focus. I would be happy to talk about these three initiatives in more detail, if you are interested.

Let me now turn to the issue of fall protection, starting with the facts supporting the need for OSHA to revise its fall protection standard. As you noted, Mr. Chairman, our new standard was adopted in August 1994 and took effect in February this year.

This standard was developed with the participation and involvement of interested parties from labor and industry, and we expect to save over \$200 million a year in wage and productivity losses, medical expenses, administrative expenses, and other costs associated with accidents.

Falls are the leading cause of death for construction workers and one of the major causes of injury. According to the Census of Fatal Occupational Injuries, conducted by the Bureau of Labor Statistics,

there were 273 fall fatalities in the construction industry in 1993, accounting for 30 percent of all the fatalities in that industry. In the roofing industry, two-thirds of the fatalities were fall-related.

An OSHA study of fall fatalities that we investigated between 1985 and 1989 found that 8 percent of the fatalities were caused by falls between elevations of 6 and 10 feet. Now, our regulatory analysis conducted in support of the standard estimated that there are 115,000 injuries due to falls each year.

Chairman TALENT. Excuse me. What percentage of the falls did you say?

Mr. DEAR. Eight percent.

Chairman TALENT. Eight percent.

Mr. DEAR. Between 6 and 10 feet. We believe that of the 115,000 injuries that occur, 68,000 would be addressed by the revised fall protection standard. We also found that approximately \$718 million is spent each year on workers' compensation for lost workday injuries as a result of falls.

We believe that full compliance with the revisions to the fall protection standard can be expected to save 79 lives and prevent 56,000 injuries annually. Just complying with the changes that were made in this fall protection standard, can be expected to save 22 lives and prevent over 15,000 injuries.

Now, the Bureau of Labor Statistics information we used in developing this standard show that 60 percent of all lost workday fall injuries occurred at heights under 10 feet; 41 percent of these injuries were to construction workers. A separate BLS study on falls demonstrated that of 110 falls from roofs, half involved workers falling 15 feet or less, and 16 feet was the prior requirement for roofing.

The injuries from falls can be extremely serious. The study the BLS conducted found that over half of these workers suffered fractures to one or more parts of their bodies, over 40 percent suffered muscle sprains and strains, or torn ligaments, and 9 percent suffered concussions.

This data lead us to conclude that falls from heights of less than 16 feet, which was the distance permitted in low-slope roofing operations prior to this change, pose a significant risk and that workers exposed to such falls should be protected. Now, that is data that illustrates the problem.

However, consider that on December 1, 1992, in Towanda, Pennsylvania, a 46-year-old roofing foreman was mopping hot tar on a roof so that another employee could apply four-by-four insulating sheets. The foreman was situated near the unguarded edge of a roof. He was not wearing a safety belt or a lanyard. As he pushed away the hot tar kettle, and turned around to retrieve a piece of insulation, his right foot slipped off the edge. He fell 7 to 10 feet, bounced off horizontal pipes, and onto a concrete ramp at ground elevation. A helicopter transported him to a hospital, where he died the next day.

We are really talking about real hazards that affect real working people. Now, I understand that since the rule has been adopted, a number of concerns have been expressed, including that the provisions are too onerous. The principal criticisms concern the infeasibility of conventional fall protection methods in certain situations

and the possibility of creating a greater hazard when using certain fall protection methods.

In drafting the standard, OSHA made every effort to account for these issues and to allow employers sufficient flexibility to deal with them. For example, the Agency recognized that certain sectors of the construction industry face unique challenges.

Thus, we specifically stated in the rule that for precast, leading edge, and residential construction work, employers may use alternate methods, which would be applicable when fall protection in the conventional sense would be infeasible or would cause a greater hazard.

All the employer has to do is to develop and implement a fall protection plan that explains the particulars of the situation and the alternatives being used. The employer would maintain the plan at the worksite and make it available to the compliance officer in the event of an OSHA inspection.

We have met many times with representatives of the National Roofing Contractors Association, the National Homebuilders Association, and these organizations are trying to work with us to develop clear guidance on what these acceptable alternate plans may be.

We are looking to find ways of making this less paperwork-intensive, for instance, not requiring alternative plans when the same model of house is being constructed over and over.

We have just received from the National Roofing Contractors Association their description of the alternate plan. We received it Friday. We are carefully going over it, and we will be in further discussion with them. This aspect of an alternate plan offers, I think, the solution to most, if not all, of the concerns that employers are expressing with respect to the standard. If we are able to agree with the Roofing Contractors Association, OSHA would be willing to publish this plan as a nonmandatory appendix in the "Federal Register."

The other major concern that I have heard concerns a level playing field. The concern that contractors who try to comply with this standard, and incur the initial costs associated with it will be placed at competitive disadvantage with contractors who do not comply with the rule and who may escape OSHA enforcement.

Now, we are limited in cases where sole-proprietors are the competitors, since OSHA's authority does not extend to situations where there is not an employer/employee relationship. We are unable to do anything about that. However, I would submit that it is not a valid reason to deny fall protection standards to construction workers on the basis of the unwillingness of certain employers to comply with minimum requirements.

To provide just a little bit more background here, at the time we adopted this standard we had fall protection standards of 4 feet in general industry, 6 feet in many aspects of construction, 16 feet for many roofing operations, and 25 or 30 feet for steel erection operations in construction. It was very difficult for us to enforce certain provisions of the 6-foot standard, and we typically relied on use of the general duty clause to get enforcement.

I heard numerous times from owners and from workers complaints about the inconsistency of OSHA's enforcement around the

country. It was impossible for firms that did business in more than one locale to be certain what type of OSHA enforcement would result with respect to fall protection.

This standard makes it clear that 6 feet is the height at which requirements will trigger. I have discussed the data which indicated to us why that was the appropriate trigger point.

Also, in our discussion with industry groups, we understood the importance of recognizing alternate means of being in compliance, and that there are simply certain operations where compliance is impossible. If you are at the peak of a roof when trusses are being erected, there is no feasible way to tie off and no violation would exist in that circumstance.

I am hoping that further discussions with these associations and educational efforts that they are conducting with their members will help clarify this for our contractors.

In summary, we have tried to carry out our mission to protect workers from recognized hazards at work, we have tried to listen to all those affected by the standards over the 9-year period that this effort was in development, and we continue to listen and try to respond. I am pleased to be here to also listen and respond to you. I thank you for this opportunity.

[Mr. Dear's statement may be found in the appendix.]

Chairman TALENT. Well, thank you for that, and thank you for summarizing your testimony, Mr. Secretary. I really appreciated your comments initially about the general direction that you and the administration are trying to take OSHA in.

Let me just let my hair down with you a little bit. In the 3 years I have been in office, I have talked to a whole lot of business people, small business people, typically, who I know are not bad people, insensitive to safety. For humanitarian and economic reasons as well, safety is usually the number one concern, so these are not bad actors. I mean, I just know they are not.

They have confessed to me the difficulty they have of dealing with OSHA regulations. What really affected me was the sense of demoralization that they feel. They feel like, well, they really cannot comply; that the Agency is almost out to get them; that as you say the concern is more interested in inspections and citing than actually in results in terms of reduced accidents.

I heard you saying that that is a direction you are trying to move OSHA away from. I just think that is vital, and I appreciate your wanting to do that. That is not specifically what this hearing is about, but I am really glad to hear that from you. I know there are people here who have been struggling with that and feel that was as well. It is the demoralization that is really wrong. I mean, they really are interested in safety, and they feel like the Agency is out to get them.

I want to ask a couple of questions, and then I am going to defer to my colleagues. Let me go into the cost of the regulation, as it has to do, first, with the regulatory flexibility analysis that the Agency prepared.

Now, there is obviously a disagreement between the Agency and many of the people here today about how much it is costing to comply, first of all, with the amount of equipment that has to be purchased.

I think you all estimated about \$250 per worker in order to comply, and they are saying it is more like \$500. We are going to hear testimony from people who have actually been implementing this, who say that the high level, that the \$500 estimate, is closer to what is really working out there. I would expect that employers and the unions involved in implementing this would, frankly, have a better idea of how much it is going to cost than you all trying to estimate.

Have you had a sense, since this thing has been implemented, that maybe the \$250 figure was a little bit too low? I mean, do you have a sense that maybe you underestimated the cost of the equipment that would have to be purchased?

Mr. DEAR. No, I do not. I mean, we have been tracking the expense. Prices did go up for certain fall protection equipment, but I assume that may have been an entrepreneurial response to an opportunity, rather than a lower estimate.

Here is what we did. We always consider cost and benefits when we adopt regulations. It is an important requirement. We need to consider both technical and economic feasibility in justifying any rule that we impose. Eighty percent of the employers affected by this rule are small businesses.

Our entire regulatory analysis is essentially conducted with a view toward requirements of the Regulatory Flexibility Act. That is why a separate analysis was not done. We do believe that there are no economies of scale, per se, with this standard. There are not differential cost impacts, lower unit costs as the size of employees subject to the standard increases, that these are effectively unit costs.

I think one reason why our estimate was believed by some to be low was an assumption of a requirement of equipment being used in circumstances where that is not what we anticipate.

Consider low-slope roofing, here it is possible to use warning lines and monitors. The use of the equipment that is contemplated, the \$250 or the \$300 set of harness and lanyard, is not a requirement; thus, the expense does not have to be incurred. In residential roofing situations, the alternate means to allow people to work from platforms that are less than 6 feet high. That is not a requirement there.

Chairman TALENT. Sure.

Mr. DEAR. The worker on the peak, as I illustrated, there is no way to tie off. I think the simple multiplication of 200,000, \$500 a worker is an exaggeration of the cost. Let me also note that our belief of the benefits from this standard approach \$200 million. That is a considerable saving. Even if our \$40 million estimate is slightly off, we still have a proposal where the benefits swamp the cost.

Chairman TALENT. Let us get into that a little bit. I notice that the analysis you prepared has a net gain, as you say, of \$200 million on issues like productivity. Now, did you take into account the lost time and productivity that will result when more workers were wearing the harnesses, for example, using the lanyards on a roof? I mean, did the Agency take into account the fact that it would take them longer to do jobs if they were wearing those harnesses?

Mr. DEAR. We did, but we also assumed that time would be saved when accidents were prevented, and the disruption associated with those would not occur. We believed that those would cancel each other out.

Chairman TALENT. Well, let me follow up this point a little bit, because this is the trap, I think, that we may be falling into with this regulation. How much time, let us say, per hour on average did you or did the Agency think would be lost by the employees having to wear the harnesses in circumstances, when they otherwise would not if not for the regulation?

Mr. DEAR. I do not believe that there was a precise estimate made in the calculation. There is evidence, anecdotal, that productivity can be increased because workers are not having to be concerned about every step and looking around because they know that they are protected from the fall. I think this is an area where subsequent inquiry to determine at a later date the overall effectiveness of the standard would be quite useful.

Chairman TALENT. Yes. I think we are going to hear some anecdotal evidence. I mean, what they are telling us is 10 to 15 percent productivity loss; in other words, maybe 6 to 8 minutes per hour extra spent because you have these harnesses you are going to have to deal with.

For example on a tear-off on a roof, if you have got to tear the roof up on one end, take and dispose of the shingles and the roofing material on another, and you are having to walk along the roof, and moving the lanyards from anchor to anchor, you can see why it would slow the job down considerably.

What the impact is out there is that it is increasing the cost of these jobs for the contractors who are complying very considerably, by 10 to 15 percent. This is basically what I want you to respond to.

Now, if it is doing that with the legitimate contractors—and they are going to say today that it is, and certainly in terms of bidding these jobs it just takes longer to do them—what we are doing is pricing them out of the market. That is leaving the market open to the fly by-night contractors who are not worried about safety or, in some cases, the handymen or, in some cases, a homeowner may be doing it himself.

I mean, I have got a skylight that is leaking, and I have got to get this skylight fixed. It is unbelievable what people charge you, pardon me to the people out there today, to do roofing work.

Chairman TALENT. My brother is very handy around the house. I think these are the calculations homeowners are going to go through. They are going to think, "Well, maybe I will go to the hardware store with my Cousin Ed, who knows about this stuff, and get up there on the roof myself and see if I can fix it."

The point I want you to respond to is, If your regulation results in even a small percentage of this work moving from contractors and roofers who know about safety, even apart from your regulation, to people who either do not know or do not care, that is going to result not in 22 fewer deaths but a whole lot of homeowners and handymen and that sort of thing falling off roofs because they do not really know what they are doing.

Did you take that into account?

Mr. DEAR. We did. We took a lot of factors into account. As I said, we will listen carefully to the testimony that is presented today. We are in continuous discussion with industry, with employers and their representatives and associations, and we will look into this.

It is clearly not our intention to create incentives for noncompliance that result in costs that are unnecessary. I mean, these are very valid concerns. I think we could also hear from employers who have found better ways of working as a result of this.

I again stress the importance of increasing understanding about the availability of the alternative means of compliance. We really want to look to that. When is the protection really appropriate? When are the issues of technical feasibility or greater hazard such that the alternate means is the way to go?

There are other costs here. When somebody falls off a roof, it is obviously tragic for that person, even if it is less than fatal. Everybody feels bad. These are small firms where everybody knows everybody, and the remorse and the guilt that sweeps people after an accident, when people know it is preventable, is a cost—not one that the economist can calculate, but it is clearly a cost.

The workers' compensation expenses borne by the industry as a result of these accidents are spread across. Some of the fly by-night contractors are not only not complying with OSHA, they are not paying taxes, they are not registered contractors. I mean, they are clearly a general problem as they compete unfairly in the market.

The workers' compensation issues are quite interesting. Typically, small employers are not experience rated. I mean, we expect larger contractors to understand the direct and indirect cost of injuries and to respond to the market signals that this sends; however, smaller contractors are not experience rated.

This is one reason why a standard is particularly important, because there is no market rating for them. The consequence of people not having that signal is we will have a higher rate of injury and illness, which is borne generally as consumers pay the cost of this activity. It is a complicated question, and we will follow it carefully. We did take these considerations into account. Our judgment was that we could save 22 lives, and prevent 15,000 injuries.

Chairman TALENT. Well, I am going to defer to the other members of the subcommittee. I am just deeply concerned that if your cost estimates are wrong, and I think it may be working out that way, you may have the unintended effect of increasing costs, losing jobs in the business, and also not only not saving lives but costing more lives because you end up with more people on roofs who do not know what they are doing. I hear what you are saying. I will defer to my colleague, Ms. Velázquez.

Ms. VELÁZQUEZ. Thank you, Mr. Chairman.

Mr. Dear, one of the claims that the witnesses on the next panels are making is that the regulatory impact statement put together by OSHA before the release of the final rule is highly inadequate. Would you please comment on OSHA's regulatory impact statement and analysis of this rule, and could you respond to claims that OSHA has no documentation that the revised standards will not have a significant impact on small businesses?

Mr. DEAR. All of our standards include an estimate of the costs and benefits of the standard. In this case, we have estimated that the benefits would be \$200 million, and the cost attributable to this change would be \$40 million. Eighty percent of the contractors subject to this regulation are small businesses; thus, the regulatory impact analysis itself comprised an analysis of the impacts on small business.

We do not believe that there are scale effects associated with this standard; it is essentially unit cost issues. Therefore, in our judgment there is not a differential impact on small business. All of those items were discussed in our regulatory impact analysis.

I should note that there was no challenge made to any portion of the standard when we adopted it. The concern has been at the administrative level, and there has not been a legal challenge.

I should further note that the administration supported changes in the Regulatory Flexibility Act, which would allow greater scrutiny of small business economic impact analyses.

Ms. VELÁZQUEZ. When I was studying this new standard, 6-foot standard, I just asked myself why 6 from 16? How do you come up with a 6 foot standard?

Mr. DEAR. I gave you several illustrations that there is a considerable hazard that exists to workers at 6 feet. Now, I imagine some people unfamiliar with the industry will think, "Well, 6 feet? Well, heck, I can hop off of a 6-foot platform and not get hurt. Isn't this going too far?" However, when we fall, we do not fall neatly in place. We fall over backwards and land on our head, we can land on a pile of debris.

In my testimony I presented three examples of fatalities that occurred at heights of less than 10 feet and other information from the Bureau of Labor Statistics concerning the number of falls from less than 16 feet. We believe that there is a significant risk of serious injury or death from falls from that height, and we have statistical data that backs that up. That is why we established the 6-foot standard.

Ms. VELÁZQUEZ. Did you hear throughout this process, 9 years that is the exact time that it took to draft and come up with the final rule, any complaints or did you receive any written letters stating that they feel that the process was not open enough, that they did not have any opportunity to raise their concerns?

Mr. DEAR. No, I did not. Let me point out that my involvement with this activity commenced in 1993, when I assumed the position, so I do not have direct experience at the Federal level with this issue. I did run the State of Washington Safety and Health Program from 1987 until 1993, and I have administered a fall protection standard at the State level.

No, we went out of our way. We reopened the record in 1993 to collect additional information and we have met numerous times with associations. I have tried very hard, as a matter of practice, to open up OSHA to comments from everybody who is affected by our work.

Ms. VELÁZQUEZ. Yes. The Chairman raised a very valid point. He is concerned the new regulation might cause an increased hazard. Did you make any study about the impact of the new regulation?

Mr. DEAR. We certainly did. More than study, our folks who worked on this standard went out and visited work sites with the assistance of the National Association of Homebuilders and the Roofing Contractors Association. They made physical observations of what is going on. It was as a consequence of those visits that the provisions relating to alternate plans were included in the standard. That was a recognition of the infeasibility or greater hazard conditions that result in roofing activities in the homebuilding industry.

Ms. VELÁZQUEZ. No more questions, Mr. Chairman.

Mr. TALENT. I thank the lady.

Ms. Kelly and Mr. Peterson were both here at the beginning of the hearing, so in that case I will alternate one party to another, and after that we will just go in the order of appearance.

Ms. Kelly?

Ms. KELLY. Thank you.

Thank you, Mr. Dear, for being here. Have you any idea how many people are involved in roofing in the Nation, how many roofing contractors you are dealing with here with this regulation? Just off the top of your head, do you have any idea?

Mr. DEAR. I was prepared to answer that in terms of the percentage of contractors affected that are small businesses, and we will get you an estimate.

Ms. KELLY. I am not interested in the percent; I am just interested in the number of people involved in the roofing industry in America today.

Mr. DEAR. It would be several hundred thousand.

Ms. KELLY. You would say it would be several hundred thousand people who are out there crawling around on the roofs today?

Mr. DEAR. That is off the top of my head. I would hope to have the opportunity to clarify that for the record, if I might.

Ms. KELLY. If you would, please. My second question is, how does that pay scale for roofers compare to the pay scale of the average construction worker? Are they paid more to be on the roofs?

Mr. DEAR. I do not know the precise answer to that question.

Ms. KELLY. You are talking about this being a significant risk. I am trying in my own mind to figure out what is a significant risk in terms of the numbers of people on the roofs versus the numbers of falls and so on. I am sure you have figured all this out in your base calculations.

However, I also am concerned, just as our Chairman is, about the number of people who are being driven out of the market and crawling around on the roofs to repair the roofs themselves. I wonder about their pay scale, if they are paid more. Did you get that note?

Mr. DEAR. My staff is terrific. Our belief is that there are 20,000 contractors in the roofing industry who have employees that are subject to the requirements of the Occupational Safety and Health Act, and that they employ 110,000 workers. This is roofing contractors. They do about \$9 billion worth of work.

Ms. KELLY. In calculating your cost of your regulation, did you also calculate the approximate number of people who might be driven into the "green economy," rather than being properly accred-

ited roofers? I mean, I am concerned about the net cost to the public purse of something like this.

Such a regulation, it would not drive people out of business, it would just drive them "officially" out of business. We will push this whole roofing business into a handyman type of thing, where the roofs are not going to be as well done. I do not think that the net cost is going to be a good one for the public. Maybe you have addressed this, and I missed it somewhere?

Mr. DEAR. Well, our discussion of the rules specifically addressed the question that it was not our intention with the rule to drive employers into—

Ms. KELLY. I realize that, but that may be an unintended consequence of the rule.

Mr. DEAR. I am sure that there are continuous temptations for a certain minority of employers to not comply with requirements. My experience at the State and Federal level is that most employers are conscientious and they will make an effort to comply if the compliance request is reasonable and if they can get assistance if they need it to do that.

There is a general problem far beyond worker safety and health for that tiny minority of employers who choose not to comply with any requirements: Tax, unemployment insurance, workers' compensation, and other requirements that employers have in order to do business.

We know that roofing is a hazardous occupation. Just look at the rates they pay for workers' compensation insurance. In most States, benefits of workers' compensation are payable whether or not the employer had a policy. It becomes a general charge that all those in the industry become subject to.

In my discussion with the Chairman, I illustrated situations where small employers are not experience rated. They do not get the economic benefit of managing safety and health that larger employers get by having their experience modification factors reduced. That creates a situation in which we would tolerate a higher rate of injury and the cost associated with that, because individual firms do not immediately get the benefit. That is one of the reasons we have workplace safety and health standards.

I think the opportunity to prevent injury and death with this standard and the benefits associated with that are going to overwhelm the problems we have with high degrees of noncompliance. It is clearly an issue, and we need to pay attention to it. I do not think it is an excuse to say, "Well, we need to tolerate some more death and more injury because of this problem."

Ms. KELLY. One has to assume that what you said, everyone knows that roofing is hazardous. But also, one has to assume that you assume a risk knowing it is hazardous by going up on the roof. I do not know of any situation in life where we can protect people totally. I am concerned and I am interested in where you came up with your cost benefit figures. Do you have more information supporting the two figures you gave us for the benefits and the cost?

Mr. DEAR. Yes. A summary description of the economic impact analysis in the preamble to the rule, and there is an extensive study which is publicly available regarding the entire regulatory impact analysis conducted for the standard.

Ms. KELLY. Personally, Mr. Dear, I would rather have somebody who knows what they are doing, a union roofer, on my roof, and maybe have the standard set a little higher, somebody who was going to give me a roof that is well-crafted and that will not leak than a handyman trying to beat the system.

I am very concerned about the effect of this pushing people out into a situation, where they are trying to beat the system and beat the cost. I hope you will consider that while you are looking at this regulation.

Thank you.

Chairman TALENT. I thank the lady.

I will just comment before going to Mr. Peterson, the regulation also applies very widely in the remodeling business and the manufactured business industry. Since you cannot drive anchors into houses that you are making, they have estimated that they are going to have to prepare 147,473 separate fall protection plans, or they would have last year, because that is how many houses they are making. That is an enormous amount of paperwork. The point I am making is that it applies outside of just the roofing business.

Mr. Peterson?

Mr. PETERSON. Thank you, Mr. Chairman.

Thank you, Mr. Dear, for your being with us. I was interested with your earlier comments that you are obviously attacking some of the image problems that OSHA has throughout the Nation. I commend you for that, because I think that is one of your major problems. The image of yesteryear as opposed to now, that is to say, being a policeman as opposed to a cooperative agency to, in fact, make the workplace more safe.

With that comes the question of the kinds of incentives perhaps a regulation like this might have to get compliance. Are you relying on the big stick or have you, in fact, tried to initiate some plans much like some of the States have done with workman' compensation that says that with compliance you get a benefit, you get something back, and that would thus be an incentive to comply—not just "If you do not, I'm going to hammer you"? Can you comment on that?

Mr. DEAR. Yes, I can. Yes, we are. We have a program called Focused Inspection in Construction. It says for a contractor, starting with a general contractor, if you have an effective safety and health program for your job site, any competent person, somebody responsible for seeing that the plan is carried out on the site, an OSHA compliance inspection will be confined to the four hazards which are responsible for 90 percent of the fatalities reported to us for construction workers. That includes: Falls, electrocutions, being caught in trenches, being struck by objects and material handling.

Our compliance people are told that if they find this effective plan, they should do an observation to see if there is compliance with standards regarding these four killers of construction workers. If there is compliance, they are to leave. They are to go find a workplace where there are violations. This program began nationwide in October 1994, and it is proceeding. I think it is creating a high degree of interest among construction employers for safety and health programs.

As part of the President's reinvention announcement last month, we took a further step with respect to our penalty policy. We said that employers who have effective programs will be subject to a sliding scale of penalties. It can go up to 100 percent of penalty mitigation for those employers with strong safety and health programs.

Let me give you an example from a dialogue I had at the White House Conference on Small Business yesterday, where I was asked by a homebuilder, "Hey, look, I'm trying to do everything I can to comply with your regulations, but sometimes some of my workers don't. I used to get penalized just as much for that one violation as it would be if I had made no attempt at all.

Now, what can you do about employee accountability issues? My response to that employer was with this sliding-scale penalty program, if they have what is required, I mean, they have a plan and they have management commitment to it, and there is evidence that they find and fix hazards, that that penalty policy would take into account their effort. It would recognize that there may be circumstances where at any particular moment an individual employee may not be doing what the employer expects.

Those are two specific illustrations of how we are trying to create incentives. Now, I am not in a position to give money back like a workers' compensation insurer, but we are trying to work with the workers' compensation insurance industry and help them understand the thrust of our initiatives. We want to see if the loss control experts they employ can advise construction and other employers about the workers' comp benefits that will flow, if they follow these recommendations from OSHA and the different OSHA treatment that will result from choosing this partnership approach to safety and health.

Mr. PETERSON. Well, I applaud that effort. I know it has been in place for a short time. I would be interested in how the industry has found that from an experience base. Back to the height standard that you have selected. You have gone from 16 to 6. You have given us the numbers that you suggest are savings and the potential from that 6. It would be interesting to me to see a matrix from a 6, an 8, a 10, a 12, and then a 16. Let us see where the cut is.

You gave us a point that 8 percent of your accidents occur between 6 and 10. That is not very much. You say at 6 feet you are going to save 15 lives and 15,000 injuries, I guess, and then \$200 million. Do you have similar numbers at 8 feet, 10 feet, 12 feet, whatever else? You had to make a decision. Did you prepare such a matrix to make your analysis, or was this 6 foot just picked out because that is the number we want to go to?

Mr. DEAR. I considered 6, 10, and 16 feet and asked questions of the staff as I reviewed their work with respect to that. I didn't do further graduations of 8 and 12 and 14 feet. If we have that information, I will be pleased to provide it to you. Eight percent is not a big number, in one sense, out of 100. If you are related to that worker who falls who is in that 8 percent, it is a huge number.

Mr. PETERSON. I know, but that is not a good argument. I was in the construction business myself for some years, and you cannot protect everyone. You just cannot. Life in the construction business is dangerous. Everyone who is in the business understands there

is a risk associated with that. I think Ms. Kelly brought that up as well. In this process, we cannot protect 100 percent. In fact, I would ask that in all of these savings you have concluded that you have 100 percent compliance.

Mr. DEAR. No, that is not an assumption of the savings associated with the standard.

Mr. PETERSON. Then right at the top your numbers are going to be skewed. Frankly, I think 6 feet is going to force a lot of people bandits. You are going to end up getting a lot of people on roofs that are ill-qualified to do that, and I think your risk is actually going to go up, perhaps, outside of the parameters of which those areas where you have jurisdiction to observe.

Mr. DEAR. Well, I hope and believe that that will not be the case. I emphasize again the advantages of the alternate plan approach, that there is a lot more flexibility than many people believe that is associated with this standard.

The 6-foot figure also came to us as a recommendation of our advisory committee on Construction Safety and Health, which is a balanced labor/management organization, as a result of research conducted by the National Institute for Occupational Safety and Health.

I actually worked in this industry as a college student. This is one of the areas where I actually have real-world experience. I got up on roofs. I was 20-something-years old, and I thought I was invulnerable. It would not happen to me, and it did not. A lot of people work and think it will not happen to them, and it does. Then everybody feels bad.

I have always admired companies who state as an objective that they want zero injuries. I passed a construction site the other day, and that is what it said on the sign on the job. As you go in the gate, it said "Nobody gets hurt." I do not think that company expects that will be what happens, but their goal is "Nobody gets hurt." I think that is the goal to have.

Mr. PETERSON. I do not object to the goal, but you are setting the "rules." I think it is up to the contractor to set the goal. The rule cannot be written to protect 100 percent.

Mr. DEAR. It does not make that assumption, that successful implementation will result in 100 percent elimination.

Mr. PETERSON. Thank you, Mr. Chairman.

Chairman TALENT. I thank the gentleman for his questions.

Next, Mr. Hilleary, I believe?

Mr. HILLEARY. Thank you, Mr. Chairman.

Thanks for coming to testify today. The Chairman, I think he asked you if you had taken into account other lives that might be lost, other injuries that might be created by every Mr. Fix-It going in there and trying to do it himself, an increase of that as this regulation goes into effect. Do you know exactly, taking it into account—and I assume you did a study—how many lives and how many injuries would result from this; and if not, how did you take it into account?

Mr. DEAR. Well, we certainly made an estimate of the prevention of injury and death that would result from full compliance with the standard. For the entire fall protection standard, our estimate is that we could prevent—let me get the right piece of paper here,

and I will give you the number that is correct—22 fatalities and 15,000 injuries, just as a result of the changes that were made in 1994 to the fall protection standard. By improving compliance with the fall protection standard generally, we would save more than 50 lives and prevent more than 56,000 injuries.

Mr. HILLEARY. Yes, but how many is it going to cause? You mentioned that you took it into account a while ago that that is part of your deliberation, internal deliberations, in coming up with this rule. If you took it into account, it would be interesting to know exactly. You have got the lives down and the estimate injuries for prevention. How many injuries would be caused by these regulations?

Mr. DEAR. I do not think that we believe that there is going to be any increase in injuries as a result of trying to comply with the standard. I mean, that is a complete contradiction of the standard itself.

I think some Members have expressed a concern that there will be some employers who will be driven out of the above-ground economy underground, and that they will cease to comply with safety and health standards and other requirements that employers have. Noncompliance itself is the source of injury and illness. It does not increase as a result of change in a requirement for a contractor.

Mr. HILLEARY. I was talking about private sector people, just people doing their own repair work, not necessarily contractors. I thought I understood you to testify that you had taken that into consideration before you made this rule?

Mr. DEAR. Well, if you are talking about having a brother-in-law come in and get on the roof, you do not have an employment relationship there. We do not have any authority for OSHA to regulate, so we made no estimate in our calculations in that circumstance. We do not have authority over sole-proprietors. Our authority extends to employer/employee relationships.

Mr. HILLEARY. You did not really take that into consideration?

Mr. DEAR. To the extent that we were talking about activities which are not within the authority of OSHA to deal with, no, we did not. I want to be clear. I mean, I think I understand your question to partly assume that compliance with the standard itself will cause injury?

Mr. HILLEARY. No, sir. I am just discussing the part that I believe the Chairman brought up, that he was concerned about individuals wanting to fix it themselves. You know, "We are professionals, don't try this at home" kind of thing. But, they would start to try it at home. I thought you had testified that you had taken that into consideration, that the increased likelihood of injuries at home, they were going to be caused because of the cost would be driven up with compliance with this regulation.

Mr. DEAR. I appreciate the opportunity to clarify. I do not believe I meant to say that. In response to the Chairman's question, which I think was, if prices go up, some people will be deterred from employing a professional contractor to do the job and will try to do it themselves or will do it with somebody who is unqualified to do the work.

Mr. HILLEARY. It is possible that there will be actually more injuries, net-net-net overall, in people doing their own work at home, and that you really have not really taken that into consideration in promulgating this rule?

Mr. DEAR. I completely disagree with an assumption that says that the product of this standard will be more injury, more death as a result of trying to improve fall protection.

Mr. HILLEARY. There has been no study on your part taken? That is your personal opinion?

Mr. DEAR. I stand by the estimate that the 22 lives will be saved and 15,000 injuries will be prevented as a result of the standard.

Mr. HILLEARY. Did you consider, and I apologize for coming in late after your statement, did you consider just tightening up the compliance with the 16-foot standard as opposed to lowering it down to 6 feet?

Mr. DEAR. We did and we have. It was the source of some complaint. We had standards of 4 feet in general industry; 6 feet existing in carpentry and other areas of construction; 16 feet in roofing; 25 feet on steel erection, if you fall inside; 30 feet, if you fall outside. I mean, we had a mishmash of requirements.

We had, because of interpretations under appeals of previous OSHA inspections, a great difficulty in enforcing the 6-foot requirement. This, for example, would occur, say, in an opening, a floor opening or a skylight. To compensate for that, we attempted to use the general duty clause of the Occupational Safety and Health Act that says an employer must keep a workplace free of recognized hazards.

This created a situation of inconsistent requirements across the country and was a source of complaint from both employers and workers. One of the purposes of the review of the standard was to set a clear set of requirements, make them standard, so that employers would know what they were required to do and make that consistent across the United States.

Mr. HILLEARY. Well, I think it is a dubious rationale when you say that to make it standard everywhere, you are going to make it intolerable on everybody in a sense. I would reject that rationale. The problem with so many Government regulations is that—well, I tell you what, I think that you ought to go back to the drawing board on this a little bit.

You think you have had problems people talking about the 16-foot and everybody complaining about that? I do not think you have seen anything yet. Anyway, thank you very much for coming to testify this morning.

Mr. TALENT. Let me just clarify. Mr. Bentsen is next, but let me just ask one question. What level of compliance did you assume in preparing the regulatory flexibility analysis? You said you did not assume 100 percent?

Mr. DEAR. We did not assume that full compliance would result in the complete elimination of injury.

Chairman TALENT. All right. I was looking at the regulatory flexibility analysis, and it says that in considering the costs it was based on reaching full compliance.

Mr. DEAR. Yes.

Mr. TALENT. In considering the cost and the benefits and productivity and otherwise, you assume full compliance?

Mr. DEAR. That is right. It is important to assume full compliance to get an accurate estimate of the cost. If you assume a certain proportion of noncompliance, then you are going to underestimate the cost that is being imposed by the regulation.

Chairman TALENT. I will probably follow up with that later, but I do not want to keep Mr. Bentsen waiting any longer.

Thank you for your patience.

Mr. BENTSEN. Thank you, Mr. Chairman.

Mr. Dear, like you, I spent a little time on roofs when I was in college as well. Being on a roof in Houston leads one to want to continue their college career, which I did.

A couple of questions, and I apologize for being late. Do you know what percentage of the roofing industry is sole-proprietorship or where there is no employee/employer relationship?

Mr. DEAR. I can get that figure for you. I do not have it off the top of my head, sir.

Mr. BENTSEN. Furthermore, do you know in terms of the residential versus commercial, what the breakdown is?

Mr. DEAR. Between the sole-proprietor?

Mr. BENTSEN. Basically, between those which would fall under this rule, and those which would not. I am curious as to how it works by market sector.

Mr. DEAR. I will find out if we have that breakdown.

Mr. BENTSEN. That leads into my next question. How do you enforce compliance with this, particularly if it does affect the residential sector?

Mr. DEAR. We have a standard and obvious compliance strategy which is to try to develop a targeting list. We use reports prepared by F.W. Dodge and worked on by the University of Tennessee for our construction targeting.

When OSHA does a random or a "program," as we call it, inspection, it must be done off a randomly generated list. It works reasonably well in manufacturing site establishments.

It works not as well as I would like for large construction projects, the kind that get noticed. It does not work very well at all for small construction sites. For inspection in homebuilding, we will often depend on referrals from other agencies that are on-site.

Other Government agencies may call up and say we have observed unsafe conditions at the site, and we will go out and visit the site. Once there, we begin a compliance inspection and will look for hazardous conditions and make observations.

I am not sure if you were here when I described our Focused Inspection Program, but that is designed to create an incentive for a contractor to have a safety and health program. If there is an effective program in place, then we are going to do an inspection that says, "Have you got any major hazards here, falls, trenches, being struck by objects, or electrical hazards?"

If you have got those hazards under control, we are going to get out of there. I had one contractor tell me that his OSHA compliance inspections went from 3 days to 2 hours, as a result of that policy change.

Mr. BENTSEN. Well, let me just ask you, in a city like, say the city of Houston, of 3 million people and you have a million buildings or something like that and maybe 100,000 construction projects going on, maybe you have got 20,000 residential projects being built at any given time. How do you pick and choose? Is it through referral?

Mr. DEAR. Well, it is the program and the referral and the worker complaint, it's the breakdown. Now, half of OSHA's compliance inspections are in the construction industry. Your next question may be, well, how many folks do we have in the Houston area that do inspections? How many of these job sites can we actually inspect? The answer is, only a fraction. Enforcement is an important part of the law, but we cannot depend on enforcement alone.

Mr. BENTSEN. Let me ask you this, because I am going to run out of time. Given that, based upon the fraction of enforcement you were able to do, do you yield the compliance and therefore the benefit that you seek through the regulation?

Mr. DEAR. Do we get it?

Mr. BENTSEN. Yes.

Mr. DEAR. We expect to see improvement. I have comments from employers in the Chicago area that believe that they are reaping that benefit already from the fall protection standard. Let me be clear. We work very hard with associations that you will hear from today, the homebuilders, the roofing contractors. They help their members in terms of compliance.

We expect most employers want to comply. Everybody understands you cannot be a successful business in this world if you deliberately or negligently let your workers get hurt. I mean, that is not a winning strategy under any circumstance. My experience is most employers will try to comply.

We are continuing to discuss with industry and with employers how the alternate means that we have established in this standard will provide the necessary flexibility to enable employers to provide a safe and healthy workplace and not incur unnecessary cost and place themselves at a disadvantage with those who choose not to.

Mr. BENTSEN. Let me follow up, then. We are going to hear from the associations after this. I have not read their testimony, but I would assume there is some concern on their part. Given that you do rely on them a great deal for this, do you feel that you have achieved the working relationship on this regulation with them, that you will get the compliance that you seek?

Mr. DEAR. I am extremely encouraged by the way these associations have come and met with us. We are not in complete agreement, and you are going to find out shortly about that. I have done everything I can to open up OSHA, so that we hear these complaints.

Now, this particular standard setting began in 1986. I hired on in 1993. One of the other fall protection standards we are working on is steel erection; we are doing this through a negotiated rule-making process. I mean, we have got the people in who are going to live with this standard, who are helping us write it.

I think that is a great way to go. As we look toward further construction industry standards, you are going to see a lot more effort

by OSHA to bring people in even earlier and get their help as we address these hazards.

Mr. BENTSEN. One final question, and you can answer this for the record. Can you quantify the public cost of this as it relates to disabled workers? In effect, will there be savings? If you are correct in your assumptions that without making this change that more would go on worker's comp, then their workers' comp would run out, and then they would go to social security disability. Have you quantified that cost or made any projections in that area?

Mr. DEAR. No, we have not taken it that far. We estimate workers' compensation expense, losses associated with time interruption with training and rehiring. We do not take in account pain and suffering, we do not take in account subsequent social insurance costs, nor do we put a dollar value on the lives saved.

Mr. BENTSEN. Thank you, Mr. Chairman.

Chairman TALENT. Mr. Wamp is next.

Mr. WAMP. Thank you, Mr. Chairman.

Mr. Dear, I have something in common with you, and that is a very strange four-letter word as a last name. In my campaign we had a slogan that just said, "Wamp Congress," just those two words. It kind of caught on, and expressed the anger that some of the people had about Congress. Something just does not sound right about "Dear OSHA." I thought I would mention it.

Speaking of that, I was at the NFIB Breakfast this morning, and I commend you for going and coordinating with them yesterday. You mentioned this advisory committee that made the recommendations to reduce the limit from 16 feet to 6 feet. I just wanted to ask you if anyone with the NFIB served on that advisory committee?

Mr. DEAR. One of the members is a homebuilder from the State of California. I am not aware whether she has a membership in NFIB or not.

Mr. WAMP. She did not ask the NFIB to have a representative on the advisory committee or any other small business organizations that represent these contractors that are regulated.

Mr. DEAR. I have made appointments to the advisory committee on Construction Safety and Health, and we wanted to be sure that there were small business representatives. One of the other members of the committee who recently resigned was a small business. He was an architect and engineering firm, not a contractor. I mean, yes, we try to have the voice of small business on our advisory committees.

Mr. WAMP. That is right where I came from is out of that industry and never served in public office and just got here. This Monday, in my office in Chattanooga, my district office, I met with Ronnie Bull and Brian Glascott, two small homebuilders. The number one concern was OSHA regulations.

Yesterday, my delegate to the White House Conference on Small Business came to my office, and said the overriding concern at this National Conference for Small Business People was OSHA reform.

I want to ask you specifically if this change were fully implemented what would be the total cost of paperwork? This subcommittee is regulation and paperwork. What would be the total

paperwork cost if your reduction from 16 feet to 6 feet were fully implemented on America?

Mr. DEAR. Our estimate of the total cost of the standard was \$40 million for all aspects of it: Buying equipment, training, paperwork. Now, let me note, one of the things we have learned since this standard took effect in February is that there are requirements to produce alternate plans which are unnecessary.

For instance, if you are developing homes and you have three or four different models, you need three or four plans. If you are doing 100 of them, you do not need 100 plans. We are preparing instructions to our field operation that that is acceptable.

We are looking at subsequent revision to the standard to say that once we have seen the industry adoption of the alternate means, which is what causes a lot of the requirement for a plan and the paperwork, once they become industry practice, the requirement for a written plan may be unnecessary. At that point I would be more than happy to remove that requirement.

Mr. WAMP. H.R. 9, regulatory reform component of the Contract With America has a provision called Title 3, risk assessment/cost benefit analysis. You have hit on this on the edges thus far. If the President were true enough to the American people to sign H.R. 9 into law, which I do not expect, but if he were, are you stating today that your reduction from 16 feet to 6 feet would meet the risk assessment/cost-benefit analysis, Title 3, component of H.R. 9?

Mr. DEAR. All OSHA standards are evaluated for cost and benefit. All OSHA standard are based on a definition and identification of a significant risk to worker health or safety.

The Supreme Court interpretations of our rulemaking authority have made it clear that those are requirements. In addition, we have to show with every regulation we do that the requirements are economically and technically feasible. There are portions of H.R. 9, and some of the versions that are being considered in the Senate, which would make, in my opinion, damaging changes to health and safety regulations. For instance, they would prohibit us from adopting a health standard that was less protective than another one that was economically and technically feasible, just on the basis of economics.

I think that is an important policy issue, and you may choose to make that change, but I think it would be most appropriately addressed in a consideration of the Occupational Safety and Health Act, not through an omnibus change in regulation in which there has been no public hearing yet on that very question.

I tell you, I consider risk assessment to be a fundamental tool in establishing good policy. The cost and benefits must be considered. I will never adopt a standard where the costs exceed the benefits. I mean, that is just counterintuitive on its face.

I think it is extremely important for people in positions like mine to make clear to the public the assumptions we use when we make these judgments. I do not believe the risk assessment and cost-benefit analysis are going to remove value judgments from the decisions we make when we establish policy.

I do not believe that risk assessment is a scientific tool itself. It is what we do when the science is less than completely clear. I

think as we apply concepts of cost and benefit, we also need to put our assumptions in front for everybody to see what the basis was.

I think there are lots of opportunities to improve rulemaking. I think the biggest opportunities come by more up front involvement of parties who are affected by the regulations as they are developed.

Mr. WAMP. Like my colleague from Tennessee and from Florida, I would just ask, in closing, as an advocate for small business—I asked to serve on this committee as my third committee and got a waiver to serve on this committee, just because of its advocacy for small business—I would, respectfully, ask you to consider the bipartisan request you have heard here today, to rethink this policy. On behalf of my position on this committee, please consider that.

Thank you.

Chairman TALENT. Ms. Velázquez and I have a few more questions for you. We just do not want to let you go. Before I say that, let me say that I am going to ask some questions to give you an opportunity to respond to what I think some of the people on the next panel are going to say. We talked about it. I think that is only fair.

I would have been happy to have you testify second or third. Just to let everybody here know what protocol is of course, and very appropriately so, that when we get distinguished witnesses like you from the executive branch, you go first, so that you can finish your testimony and leave. That is the reason we did not do it.

If you would like some of your staff people to stay and have an opportunity to make comments, either at the time or later for the record of what people say, I would be happy to accommodate you in that respect.

Before I go to Ms. Velázquez, I just want to clear something up. I think I have heard you say twice now that these alternative fall protection plans, that your interpretation of the regulation is that they do not have to be a separate plan for every site that you are working on.

My understanding of the regulation was that they have to be site-specific, that they have to be drawn up specifically, and I think it says that, specifically for the site. Now are you saying that that is not the case? If you have one plan, you can use it for every roof or all roofs like the one you drew it up for? I want to clarify that.

Mr. DEAR. Your literal reading of the standard as published is correct. I have said many times that we continue to meet with industry representatives and we are listening.

Chairman TALENT. OK.

Mr. DEAR. One of the things we heard was, "Hey, we are just Xeroxing these plans. It is the same model house. You know, be realistic." I mean, I think the point is well-taken.

When I met with the homebuilders, I said we were going to work on that. I think one of the suggestions we received last week from the roofing contractors is along the same line. If I have to reopen the rule to solve that, I will. I think we may have administrative flexibility and enforcement flexibility to deal with that, but it is one of the things we learned after we adopted the standard. We take it into consideration.

Chairman TALENT. I will ask the Ranking Member—I understand she has a few more questions.

Ms. VELÁZQUEZ. Thank you, Mr. Chairman.

Mr. Dear, the National Roofing Contractor Association will be testifying this morning. They claim that safety equipment is very expensive and that a lot of it needs to be replaced, and also the training that goes with it for the use of the new equipment. Do you have any of the cost estimates?

Mr. DEAR. Yes, I do. In terms of the cost that would be incurred by a roofing contractor specifically, of the \$40 million cost that we estimated for the standard we believe \$25 million will be incurred by roofers, as a result of purchasing equipment, of doing the training in order to be in compliance with the standard.

This includes additional training at about \$6.6 million; test and safety nets, \$5.4 million; and additional fall protection of nonroofing employees \$1.5 million. We have really tried to take into account the costs. As I have noted, we believe that the benefits far overwhelm the costs associated with coming into compliance with the standard.

Ms. VELÁZQUEZ. The National Association for Association of the Remodeling Industry also will be testifying this morning. They claim that OSHA did a lousy job in getting out the regulations to the public. Would you please comment on that?

Mr. DEAR. We did the very best we could. We had initial public hearings in the mid-eighties. We reopened the record twice, once in 1992 and again in 1993. We met with associations. We took their comments for the record. We met with them outside of the hearing process, before and after the adoption. We did everything we could.

Could we do more? We probably could. I stress, I have tried to make OSHA very open to public comments from all those who are concerned. If there are additional concerns, we would be pleased to listen to them.

Thank you, Mr. Chairman.

Chairman TALENT. I would like to add to the lady's comment that, although it took 8 or 9 years to do this, it is pretty clear from the record that one of the reason it did is that you were trying to accommodate different industry points of view, and that those points of view did not always stay the same. They were changing their minds, and the union I think was also.

I do not want to penalize you for being open. In fact, that applies to your whole testimony. One of the problems with coming in admitting that you can do things in a better way is that you are opening yourself up to people coming on and criticizing you. I appreciate your openness in doing that.

I do not think anybody else has questions. Let me just close with two or three points I want to follow up with. Again, relying on what people are going to be saying after you finish your testimony. I have one witness who runs a roofing company and testifies that he has invested \$410 per employee for harness lines and lanyards. He has purchased attachment anchors that cost anywhere from \$65 per project to \$300 per project. Even more disturbing to him, and frankly to me also, is that they are installing 27 percent fewer square feet of roofing because it takes so much longer if they are hooked up to these harnesses. This is making his business much

less price-competitive. I have other testimony to that effect. I just called home, or my staff called home, and got some estimates from remodelers about how much it would cost for skylight installation. That is not for my home, by the way.

Chairman TALENT. There is an extra 10 percent, I mean, consistent estimates that would have been \$1,200, it is \$1,325; for roofing, it would have been \$5,000, it is \$5,525. First of all, I know you are looking at what people are saying about your cost estimates. If you conclude, and I am not going to put you on the spot and say, "Well, do you accept these?"

If you conclude that the cost estimates were off, would you consider maybe reopening for a negotiated settlement, since it seems like labor and management can get together on this—maybe a negotiate rulemaking, excuse me, to come up with a different standard?

Mr. DEAR. I believe we are constructively accomplishing that now with the discussions we are having. I think that as a matter of practice it is a good idea to evaluate standards, probably not 6 months after they take effect, but to do a retrospective review.

It has been enormously useful to me in telling the story of OSHA's effectiveness to refer to standards which were evaluated and whose benefit, in terms of injury prevention or illness prevention, is now documented. I think that should occur for this standard. If it is having all of the dire consequences predicted for it, then clearly we would have to take a look.

In the meantime, I think we have got to do what we are doing, which is sit down and talk about, "Well, practically, how is this going to work?" If I do not get a chance, Mr. Chairman, I want to tell you how much I appreciated how you conducted the hearing. I will certainly leave some staff behind who will be able to answer questions that you have or to respond, if that is required.

Chairman TALENT. What I have heard, you are emphasizing the practicality, which I think is very good. There is one aspect of what you have said that does not do that, and that is what disturbs me the most. I think it was in response to Mr. Hilleary's question.

We just did not compute what might happen, if there were more sole-proprietors or more homeowners doing more work on roofs or on staircases because of this, because they are not within our jurisdiction. If they fall, they are just as dead, whether they are in your jurisdiction or not. Those people count, too, in terms of injuries.

It really would be a shame if after 9 years, and I think the Agency really has engaged people and tried to do the right thing, you end up with a standard that costs a lot more than you thought and does not save lives, because in the real world, practically, you have got people out there doing this who do not know what they are doing on roofs. I just cannot emphasize that enough really to you. I guess you have heard it about 15 times, so I will not ask you to respond to it, unless you would like to.

Mr. DEAR. We have got to see evidence. Does this assumption of an increase of fly by-night activity, is that really borne out? Is that really happening? We have got to see the evidence, just like we have got to see the real cost evidence. Then you have to got to run jobs like this based on the facts, and you are here to make sure we do.

Chairman TALENT. I thank you. I do not think anybody else has more questions for you. Thank you again for your patience.

Mr. DEAR. Thank you, sir.

Chairman TALENT. I will ask the next panel to come forward. OK. After the come forward and I introduce them, we will run a video on this.

I am going to introduce the next panel all at once, and then we are going to see a video. I think we need to have that facing a little more toward us, so that the members of the subcommittee can see it. We will wait until Ms. Velázquez and Mr. Wamp come back to play the video, but I will go ahead and introduce you in the interest of time.

Mr. William Good, who is the executive vice-president of the National Roofing Contractors Association, from Washington, DC; Ms. Patty Burgio, the director of government affairs, the National Association of the Remodeling Industry, Arlington, Virginia; Mr. Dan Gilligan, vice-president, Manufactured Housing Institute, Arlington, Virginia; and Mr. Howard Saslow, member of the National Homebuilders Association, from Washington, DC.

We invited representatives from the various interested unions to appear, and they submit a joint statement with the roofers, but they were not able to make this date. We really did try to accommodate them. I want everybody to know that I wanted everybody to have an opportunity to testify.

I am going to wait to play the video until the other members of the subcommittee get back. I do not want to delay the testimony. Mr. Good, why don't you just go ahead, and then we can have the video after your testimony. I always liked school when they had a movie, so I try to have a video as much as possible.

TESTIMONY OF WILLIAM GOOD, EXECUTIVE VICE-PRESIDENT, NATIONAL ROOFING CONTRACTORS ASSOCIATION

Mr. GOOD. I always like to speak before the movie. Mr. Chairman, thank you for allowing us to be here. My name is William Good, one of those four-letter names. I am executive vice-president of the National Roofing Contractors Association, NRCA.

We are a 109-year-old trade association. We have more than 3,500 members from all 50 States. We really are grateful for the opportunity to be here today and offer some views on this new fall standard, which has had a huge impact not only on our members, but also the employees in our industry and indeed on homeowners all over the country.

Mr. Chairman, I have prepared a written statement that I ask be included in the hearing record. My comments this morning are intended to summarize the written statement.

Chairman TALENT. Without objection, that will appear in the record. Again, I would encourage all of you to go ahead and summarize. We do have your written statements. That gives the subcommittee more time to ask questions.

Mr. GOOD. Our industry, Mr. Chairman, is older than OSHA, it is older than the Congress, and it is older perhaps than all but one or two noteworthy professions. We do understand in our history that falls represent a hazard. We are anxious to arrive at some reasonable standards that can help us address the hazard.

It is a very serious concern of all of our members, and I want to make sure that the committee understands that we understand that falls are, indeed, a problem. We also understand that people do, in fact, fall when they are performing roofing work.

Roofing is a hazardous job. There are lots of things we think that can be done to minimize or even prevent the risk of people falling while they are performing roofing work. I actually think the industry has done a lot to accomplish that voluntarily, and we have done a lot also in working in cooperation with our friends from the United Union of Roofers, Waterproofers, and Allied Workers.

I also believe that OSHA was well-intended when they developed and promulgated this new standard, as Mr. Dear, testified here just a few moments ago. Nonetheless it took them nearly a decade to do it. It took 9 years from the time that this rule was first issued as a proposed rule to the time that a final rule was issued.

Recently, as Mr. Dear suggested, OSHA has indicated a willingness to work with us to try to arrive at some remedies for this. We are equally encouraged that that will happen. I think that process and the openness that he has reflected here this morning is very encouraging to our industry. My remarks this morning will tend to focus instead on the rulemaking process.

I think that in many ways this new fall standard is a good example of everything that is wrong with the process today. This Notice for Proposed Rulemaking was issued in 1986. The docket for public comment was closed in 1987. It was reopened a couple of times for very narrow reasons. A final rule was not issued until August 9, 1994.

We are not entirely sure why it took that long to get from a notice of a final rule; although, we do know that a lot things changed in our industry. We are using different material; we are using different equipment. The insurance market changed a lot in our industry in that 9-year period, and the environment for protecting workers from falls changed also.

We understand, Mr. Chairman, the difficulty of prescribing that a rulemaking be done too hastily, but we also believe that if an agency cannot conclude the process in a reasonable period of, say, 3 or 4 years, that it would be reasonable to have the rulemaking process revisited, have the rule reopened so the changes that take place in the industry can be considered.

OSHA, we have talked a lot this morning already about the cost estimates. We obviously think that the \$25 million estimate for the roofing industry is way too low. We now know, and you will hear testimony later from some of members this morning that a cost on the order of \$500 per worker is probably a much more reasonable cost estimate just for the equipment. There are also training costs associated with the standard.

Certainly, there are a lot of costs associated with lost productivity, and indeed with lost sales. When a roofing contractor loses work as a result of a standard, those costs need to be considered in the estimate.

Bureau of Labor Statistics says that there are 200,000 roofing workers in the United States. We concede to Mr. Dear's point that perhaps not everyone of those 200,000 are required to have \$500 spent on them. But even if it is half of that number, that still takes

us to twice the OSHA cost estimate, just by itself, without considering anything else.

I think the problem is not just that the estimate itself is low, that the cost estimate is low, but I would argue that OSHA really had no way of knowing what the cost would, in fact, be because a lot of the remedies that are prescribed in the standard are things that were not commonly available, have not been commonly available in the marketplace, and have not commonly been used in our industry.

Safety belts and lifelines, for example, on roofing workers at 6 feet on relatively low-slope roofs did not happen before. It was not a common practice in our industry, and so they had no way to really project what the cost would be.

The proposed rule, the 1986 version, would have left the 16-foot height trigger in place. The 6-foot consideration was one of a number of questions that were posed for comment in 1986, but it took us several years to find out that that was really being considered. We found that out long after the docket had been closed, and we had had the opportunity to comment.

When a final rule, I would argue, differs significantly from a proposed rule, it takes away all of the reasons for having a proposed rule in the first place. What is even more troubling, we think, is that the rule is based on data that are, at best, inconclusive. We know that roofers fall and get hurt. Again, I want to emphasize we are not debating that.

We also know, however, that the majority of those falls are not from roof edges. Roofing workers fall in lots of different ways. The biggest problem we think we have in the industry are falls that involve ladders. This standard does nothing to address the problems of falls from ladders.

The definition of "falls" also include falls at the same level, people walking and tripping. We also know that roofing workers fall through openings. If the decks on your home or building are deteriorated, people will fall through that. Falls from roof edges, in fact, are a minority of falls that occur in our industry.

I would also like to point out that the final rule describes the compliance with the Regulatory Flexibility Act. This is very familiar language to us, and I am sure to all members of the subcommittee. I would emphasize that just about all of our members, all roofing contractors in the country, are small business entities. They are subject to the Regulatory Flexibility Act.

It is hard to imagine a standard that could have more of a significant impact on them than this standard. It is an excellent example, I think, why NRCA and others support amendments to the Regulatory Flexibility Act to allow for judicial review. We are bound to accept the OSHA determination as to the impact on small business.

We have no recourse as small businesses to challenge that finding, and we would certainly support a remedy to that. We know, Mr. Chairman, there are ways to prevent falls in our industry. Most professional roofing contractors work very hard to see to it that their workplaces are safe.

This new rule, unfortunately, does not contribute to safety. It instead encourages roofing contractors to do nothing at all. It pro-

vides disincentives for them to try to compete with the fly by-nights, to try to compete with the handymen, and the people who work for cash on weekends.

In its rulemaking process, OSHA arrived at a remedy that was proposed 8 years prior, a remedy that adds cost well beyond what OSHA imagines, and in fact creates greater safety hazards on the job site.

Even more unusual, I think, in this rulemaking process was the fact that OSHA ignored a joint recommendation that was presented to it, made by both NRCA and the United Union of Roofers, Waterproofers, and Allied Workers that we maintain a height trigger for this requirement of 10 feet, rather than 6 feet.

I will summarize by saying that in our industry, I think it is fair to say, no one likes this rule. Our members do not like it, our employees of our members do not like it, and certainly the homeowners who have to pay for it do not like it.

We think the real solution to this is not in short-term fixes to this rule; although, we are encouraged that some of those may occur, but in finding some real improvements to the rulemaking process that include real risk assessment, real cost-benefit analysis, and that allow for judicial review under the Regulatory Flexibility Act.

Mr. Chairman, I appreciate the opportunity to share our views with you this morning. I will of course be happy to answer any questions.

Chairman TALENT. Thank you.

Ms. Burgio?

Chairman TALENT. We will hear from all of you, and then ask questions.

[Mr. Good's statement may be found in the appendix.]

TESTIMONY OF PATTI BURGIO, DIRECTOR, GOVERNMENT AFFAIRS, NATIONAL ASSOCIATION OF THE REMODELING INDUSTRY

Ms. BURGIO. Mr. Chairman and honorable members of the subcommittee, thank you for inviting me to discuss the implementation, after the fact, of the new OSHA fall protection standard. Our members have never been so upset about a Federal rule, with the possible exception of the OSHA Hazard Communication standard.

NARI is a not-for-profit trade association with nearly 6,000 member companies nationwide representing more than 40,000 remodeling industry professionals. Our typical residential remodeler member has been in business for more than 5 years, has less than five employees, and generates less than a quarter of million dollars in sales each year. These are very small businesses.

However, residential remodeling constitutes a \$100 billion industry in this country that has grown over 130 percent in the last 10 years. OSHA's new fall protection standard has a tremendous impact on these very small businesses, one that we believe was not accurately accounted for in the drafting of the regulation.

I conducted a survey of our NARI chapters across the country regarding some basic questions about the new rule. When asked whether they believed OSHA did an effective job in publicizing the

new rule 88 percent had answered no. Most of them had learned of the rule through NARI or various other trade publications.

Forty percent of those who responded had requested information from OSHA, yet only 35 percent of them found that it was very helpful. Probably due to the fact that the recent OSHA pamphlet was only released last month. I have then asked for an estimated per worker cost for compliance with the new rule including: Equipment, training, and inspection cost. The average cost was over \$1,400 per worker. This figure does not include an estimate for lost production time and lost remodeling projects, due to the cumbersome and costly nature of the regulation.

Finally, I asked for an estimate of the cost of compliance as a percent of their company's total revenue. The average cost for compliance was 6.8 percent of their total company revenue. Now, this figure is far greater than that reached by OSHA in their Regulatory Flexibility Act analysis.

OSHA estimated that "compliance cost represents less than .01 percent of total construction revenues and less than .05 percent for each individual construction sector."

Now, if these figures were applied to small remodeling firms, I can assure you they are very far from reality. For example, if the company had three affected workers and the equipment cost just \$500 per worker, then the total company expense would be, at a minimum, \$1,500. If this expense figure is to account for only .05 percent of the company's revenue, that means each employee would have to generate \$1 million in sales. This is extremely unlikely in residential remodeling, particularly in light of the size of our member companies.

Further, OSHA concluded that the impact of the revised rule "will not have a significant impact on a substantial number of small entities." Well, a mere 7 percent increase in overhead can easily put a strong remodeling company out of business.

I am certain that young companies will have a much more difficult time absorbing these expenses and passing them on to the consumer. Profit margins for small remodelers often hover around 5 percent. OSHA estimates that this new rule will result in the prevention of 22 fatalities, assuming 100 percent compliance.

However, I do not believe OSHA anticipated nor accounted for the distinct possibility of increased accidents and injuries, due to the cumbersome nature of the required equipment. Entanglement of lines is a recurrent concern voiced by the industry.

Despite the logistical problems and underestimated cost, the number one concern for our members is that they have been told by OSHA personnel that the general contractor is responsible for the safety of all the independent or subcontractors on the job.

If the general contractor supervises or instructs the subcontractor as to the ways and means of doing the jobs safely, the IRS would then classify that subcontractor as an employee for Federal tax purposes. This creates a Catch-22 situation for our members and for most remodelers that use subcontractors.

As you know, the status of independent contractors is a major concern to our industry. Conflicting Government regulations and requirements will only add to the confusion. Our friend Wayne Kaufman, of United Homecraft, in St. Louis, reports that "This is

a big, big problem for those of us who use independent contractors. If they are not in compliance, then they should be the ones who are cited."

Yet, OSHA has no jurisdiction, we have heard, over sole-proprietors and a lot of subcontractors. The fines and penalties should not escalate up to the general contractor.

On behalf of the members of the Greater St. Louis NARI Chapter, Wayne states, "That while we support the intent to create safer workplaces for our workers, we are bombarded by complaints that the protective gear is actually causing more accidents. We are not certain this rule works as it was intended."

I would like to share just some of the other comments I have received from our membership since February:

"OSHA might as well make it a 1-foot rule, because there is little work to be done under 6 feet in remodeling a house."

"Perhaps this is a good idea, but taken to an absolutely ridiculous extreme."

"Certainly, fly by-nights will have a much greater advantage over those of us who are trying to comply."

"The ropes and belts will be as much a hazard; workers can trip or twist an ankle from stepping on each other's gear."

Finally, "Please leave the lifelines and safety nets to the high wire performers in the circus."

Some claim that their insurers are not inclined to lower workers' compensation rates, even with the new safety systems in place. They are not convinced that these rules will lower their accident rates. This is interesting because workers' compensation is one place OSHA believed would be an area of savings for construction companies.

Other chapters have complained that OSHA officers, who they have invited to their chapter meetings, were unable to answer practical, implementation questions and what-if scenarios.

Generally, the membership is dissatisfied with the lack of information and resources provided by OSHA, the practicality of the rule, and its real effectiveness. It appears that the benefits do not outweigh the cost, confusion, and possibly dangerous consequences.

If proper and accountable risk assessment, cost-benefit and regulatory flexibility analysis had been conducted, subject to judicial review, we believe that this standard would have never been lowered from the previous 16 feet to the impracticably low 6 feet. We urge the subcommittee to push the entire Congress to take a look at the feasibility and practicality of this new rule, either in the context of a regulatory moratorium, a legislative review or veto, general regulatory or OSHA reform, or perhaps an item for "Corrections Day." Whatever the vehicle, something must be done.

Thank you, Mr. Chairman, and your staff for inviting me to outline some of the post-rulemaking problems members of the remodeling industry face in light of this new rule. We hope this hearing will draw greater attention to this particularly problematic regulation.

Chairman TALENT. I thank you. Before we go to Mr. Gilligan, because some members of the subcommittee may not make it back precisely after the vote, I would like to go ahead and play the video. I think it is appropriate anyway, so that the members of the

subcommittee can just visually see what these safety precautions entail. I am going to ask you some questions later, Ms. Burgio, about what it entails in home remodeling. I think we can all kind of visualize when you use this on a roof, but in terms of home remodeling it is harder to see. It does not apply when you are using a ladder; right?

Ms. BURGIO. Right.

Chairman TALENT. It applies when you are up on a height, but you are not using a ladder. Maybe after the vote, you could just give us some common instances we could relate to about when it would apply in the remodeling business.

It is not working? If my 5-year-old was here, he could do it. They know the VCR's. It is a Headline News segment.

[Video.]

"Live from CNN Center, this is Headline News with Lyn Russell."

"Ms. RUSSELL. New Federal safety standards went into effect this year in the construction industry. Some contractors are claiming the new rules actually make their work more dangerous.

"Mr. CLARK. The new regulations require roofers across the United States to wear harnesses with safety lines or use other protective devices when they are working more than 6 feet off the ground. The rules are designed to prevent falls. Roofers claim they make their work more dangerous.

"The harness regulation is one of a number of safety measures that the Occupational Safety and Health Administration put into effect earlier this year. According to the Labor Department, falls are the leading cause of death in the construction industry.

"Under the regulations, this is considered to be a steep roof requiring safety equipment. Seventy-one-year-old homeowner Albert Vaughn says he has no trouble getting around on it.

"I have been all over the roof. Yes, doing all I want up there.

"Mr. CLARK. In this Dallas neighborhood, only one out of a dozen roofing companies appear to be complying with the new rule. That irritates John Diel. His roofing company spent thousands of dollars on safety equipment.

"Mr. DIEL. Either they have got to enforce the law or get rid of the law, one of the two.

"Mr. CLARK. When Diel said that to a Dallas newspaper reporter, one of his competitors left a message for him.

"Why don't you all shut up and quit going to the newspapers—about the OSHA bullshit. All you are going to do is just cause a lot of problems for a lot of the other roofers out here.

"OSHA officials say they do not have enough inspectors to see if all of the roofers are complying. I believe people like John Diel are paying the price for following the law. Tony Clark, CNN, Dallas."

Chairman TALENT. All right. We will go ahead and adjourn for this vote, and then come right back and take up the hearing again.

[Recess.]

Chairman TALENT. I talked to Ms. Velázquez, she may be another minute or two, but we will just go ahead. I think, Mr. Gilligan it was your turn.

[Ms. Burgio's statement may be found in the appendix.]

**TESTIMONY OF DAN GILLIGAN, VICE-PRESIDENT,
MANUFACTURED HOUSING INSTITUTE**

Mr. GILLIGAN. Yes. Mr. Chairman, I am Dan Gilligan. I am vice-president of the Manufactured Housing Institute. I would like to thank you for inviting me to testify today. I would especially like to thank you for holding these hearings on this fall protection rule.

The manufactured housing institute represents all segments of the manufactured housing industry. We have approximately 270 factories across the United States that build homes on assembly lines in factories, and then we have about 5,000 small business firms, contractors, that do all the installation work on the homes out in the field.

Interestingly enough, this rule does not apply to our homes as they are in the factory, but it does apply when the homes are delivered in the field, whether to a model home center or to a building site. That draws into effect our 5,000 small business firms that do all the field work on manufactured homes.

We do believe that OSHA totally overlooked the cost-benefit, or the cost to our industry in complying with the rule. If they say the total national impact was \$40 million, we have estimated it could have a \$20 million impact simply on our industry alone.

Last year, we built over 300,000 homes. We are approaching nearly 30 percent of all new homes built and sold in America. Half of those homes are what we call "sectional homes," where they are joined together by a building crew in the field. At this point when a home is delivered in the field, it takes maybe two persons working maybe 1 to 2 hours to do the work on the roof, joining it at the top.

Let me tell you what we do, and then I will tell you what OSHA says we should do under the new regulations. What we do now—generally, a home is delivered to a building site. Generally, a two-person crew meets, places the home on a foundation, joins it together, they get on the roof, do the roof together, they join the roof together, finish off, they do some shingle work, and then they go down and finish the lower section.

What OSHA basically in this regulation is saying that we have to do is, one, we have to devise a plan. When the home arrives to that site, we have to have a written plan on how we are going to protect those two workers who are working on the roofs, how we are going to protect them from falling.

Then OSHA says we have to designate a "controlled access zone" around that home. When the two-man crew shows up to join the home, they have to put wire out or tape or something they have to put around the home and say, "This is a controlled access zone." Generally, there are only two persons there working, but you designate this as an area.

Then, once they have the controlled access zone, then they have to have a safety monitor. Now no longer can you have two persons working at the building site, joining the house together at the roof, you have to bring a third person along, but this third person is not allowed to help work. He has to stand and watch the two guys that are joining the roof together. He has to warn them when they get close to the edge.

Chairman TALENT. That is the job I want.

Mr. GILLIGAN. Yes, really.

Now we have added manhour costs to the site, but it has also added to the aggravation of the two guys who are actually working, because now they have this supervisor that is watching them and warning them when they get close to the edge.

Of course, our roofs are very low slope. Very rarely do we build a home over 4:12 pitch because of highway. We build the homes in the factory, deliver them in the field, and very rarely do we go over 4:12 pitch. Our risk is very minimal in that regard.

We estimate that to do a plan, and we use the National Association of Homebuilders' model, to write a plan as OSHA says it must be written, it would take about an hour and a half to write each plan. It would take about a half an hour to designate, do all the things on the controlled access zone. Then you add a third person to be the safety monitor, to watch them work on the roof. All we have really done, in our estimation, for \$20 million is add a lot of bureaucratic red tape to a very efficient building system.

I was going to tell Congressman Wamp that I was in Tennessee this week, and sometimes they shoot the messenger in Tennessee. I really did not want to tell the contractors down there that this is what they are expected to do now, that they are expected to write the plans. I sort of dodged the issue.

The small business people really will not comply with this regulation as it is written. As much as we communicate with them that this is now Federal regulation, something they must do, I do not think that you are going to see a significant amount of compliance.

Our members are worried about lawsuits, that there might be lawsuits as a result of not complying with the OSHA regulations. They are not worried about an OSHA inspector visiting their building sites. As was evidenced in earlier testimonies, that is probably not going to happen. However, we do worry about the legal implications of not being in compliance with the Federal requirement.

Just last week, I was talking to Congressman Chrysler, from Michigan, who operated a business in Michigan for many years. He said when he opened the door at his business at 7 a.m. every morning, he knew by 7:15 that he had violated at least three Federal regulations.

That is what this rule is basically going to do for our small business members. It is going to force them to violate Federal law, because I do not think that they are going to comply. I do not think they want to comply, but it does not mean that we do not care about worker safety.

I began working in the manufactured housing industry during an exposition at the University of Notre Dame, where the crews would come in and set up hundreds of homes. Having talked to those people, I just know that they would see this whole requirement of writing a plan, designating a controlled access zone, and then having a safety monitor stand there as a waste of their time and a waste of the consumers money.

Basically, the cost is passed on to the consumer; you may be adding as much as \$100 cost to every sectional house. For what? We do not have a bad safety record. I tried to find one instance of a fall. I called several of our members, and I have not found any. The rule does not fit us at all. It is creating, certainly, a lot of aggrava-

tion of our members who are now being told this is what is required.

Thank you.

Chairman TALENT. Thank you.

Mr. Saslow?

[Mr. Gilligan's statement may be found in the appendix.]

TESTIMONY OF HOWARD SASLOW, MEMBER, NATIONAL HOMEBUILDERS ASSOCIATION

Mr. SASLOW. Mr. Chairman, Ms. Velázquez, thank you for the opportunity to appear this morning to comment on OSHA's fall protection standard. My name is Howard Saslow and I am the production manager for Hallmark Builders of Columbia Maryland, a firm specializing in the construction of single-family homes, producing approximately 30 homes a year.

Before I begin, Mr. Chairman, let me state clearly that NAHB and its member firms are deeply committed to job site safety. Indeed, I feel that our industry's national efforts have had a significant impact on the level of overall safety knowledge and awareness on residential job sites, a fact that has been recognized by OSHA. In fact, NAHB was the first organization to develop a complete set of fall protection compliance materials for the construction industry on the new rule.

I mention this because NAHB's policy does not support the complete elimination of the fall protection standard. NAHB members do, however, believe that significant modifications must be made to the existing requirements. One of the most important issues raised by NAHB about the current standard was the difficulty in using conventional fall protection systems during many homebuilding activities.

In many stages of the house framing or carpentry process, a worker cannot use nets, guardrails, or personal fall-arrest systems to protect against a fall. In most of these situations, there is simply no adequate anchor point to support the weight of an employee's fall.

In fact, strict compliance with the revised rule can still pose even greater hazards than those created by noncompliance and also contain unnecessary costs in the form of increased repetitive paperwork.

After many meetings with OSHA, one of which took place on one of my job sites, NAHB began to impress upon the agency that homebuilding is, indeed, different than commercial and industrial construction. Consequently, the fall protection standard is the first regulation in OSHA history to recognize residential construction as distinct and different. Although these actions are appreciated, the rule still places a tremendous burden on the average builder.

In order to purchase a fall-arrest system that will adequately restrain a worker, a builder must spend anywhere from \$350 to \$1,000 per worker for the restraint device alone. These estimates are exclusive of other hard and soft costs associated with the regulations requirements.

Please make no mistake about it, the effect of current fall protection compliance can literally mean the difference between profit and loss for a corporation or a sole-proprietorship.

Let me offer a practical example. A small roofing contractor in Florida with six workers who installs tile roofs would have to invest approximately \$6,000 in fall-restraint systems, even though his work is primarily on a single-story roof with angles of only 19 degrees. Because of the practical difficulties, the standard simply cannot stand up to a reasonable cost-benefit analysis.

Let me now briefly isolate those problems and issues, and outline our proposed solutions, all of which have been discussed with Joe Dear and the OSHA staff. Throughout the final drafting of the fall protection rule, OSHA detailed a nonmandatory appendix as the only way that a contractor could adequately protect his or her workers, while using alternate fall protection systems. NAHB was actively involved in the development of these alternate systems.

NAHB stands behind the methods outlined in this appendix, but strongly opposes the enormous paperwork burden required by OSHA for these safe work practices to be utilized. To use an alternative system, a builder must in every instance develop a fall protection plan for each house constructed. The plan must detail in writing exactly why conventional fall protection systems cannot be used during construction activities.

OSHA could reduce this paperwork burden by simply requiring that there be one fall protection plan per company. OSHA could also uniformly recognize circumstance when alternative methods are acceptable. This would allow OSHA to focus on actual hazards, rather than on paperwork.

Probably the major issue of concern is the height at which the new fall protection standard takes effect. The old standards took effect if workers were at heights greater than 16 feet, more restrictive than some State requirements such as California's 20-foot threshold.

The 6-foot requirement is probably the most onerous aspect of the new standard, since almost all elevated work in homebuilding exceeds this height. Take foundation construction, when a foundation wall is about 8 feet high, which occurs in all homes with basements, fall protection must therefore be provided.

Such protection during the pouring of concrete foundations is quite difficult, since the forms used during the process are not stable enough to attach heavy scaffolding. There is no sound reason to believe that requiring fall protection during this process improves worker safety.

The 6-foot requirement is also very burdensome during excavation activities, or decking procedures, and exterior wall erections. OSHA should raise the height requirements to 10 feet for nonroofing activities, an action that would provide enormous cost relief to the industry, while maintaining more than adequate protections for workers.

The 6-foot threshold also requires roofers on a single-story home and even garages to be in full-body harnesses. Consequently, NAHB also supports an 18-foot threshold for roofing and framing which we believe would provide protection to workers involved in homebuilding and substantially reduce compliance costs.

The standard's current definition of a "low-slope roof" is another major concern for the housing industry. OSHA's current definition requires personal fall-arrest systems for a roof pitch greater than

4:12 or 19 degrees. A single-story home with a roof pitch of 6:12, which is only a 26-degree angle, should not have to have a personal fall-arrest system to protect workers. Yet, the new regulation requires it.

Think of a 45-degree angle, most people would agree that you could safely balance on such an angle. Now consider that the angle of a 6:12 pitch is about half of that. A worker can safely move around on that surface without the burden of fall protection equipment. NAHB believes that OSHA should raise its height definition of low slope roofs to at least 6:12 or provide some alternative that protects workers without unreasonably burdening small businesses.

As I conclude, I would like to emphasize that many more workers are involved in work from high places who are covered by the fall protection regulations. These contractors include: Painters, framers, siding contractors, gutter installers, et cetera. Each of these contractors must adhere to the regulation, incur the cost, and ultimately pass the cost along to the buying public through the builder.

As a builder currently working with a safety program, I can assure you that the cumulative cost of all of these costs has increased my company's cost beyond \$1,000 per house. Full compliance with OSHA's regulations would increase the cost tremendously beyond \$1,000. Please remember for each thousand dollar increase in housing costs 21,000 members of the buying public are driven from the housing market.

Let me reiterate, Mr. Chairman, that NAHB does not support the complete elimination of fall protection requirements. NAHB does, however, believe that OSHA should make the modifications I have just outlined for the subcommittee. Should the Agency continue to choose not to accept these common-sense recommendations, then NAHB would ask the Congress to require OSHA to do so statutorily as part of the OSHA reform package slated for full House consideration sometime later this year.

That concludes my statement, Mr. Chairman. At this point I would be happy to answer any questions which you or the other members of the subcommittee may have.

[Mr. Saslow's statement may be found in the appendix.]

Chairman TALENT. Thank you, Mr. Saslow.

Let me ask a couple of questions here. First of all, maybe the staff Mr. Dear left behind could answer this. Mr. Gilligan was not able to find a death that occurred due to a fall in the manufactured housing business.

Is that what you are telling me?

Mr. GILLIGAN. We do not have the research capabilities to determine that, but I have not been able to determine—and I talked to a lot of our members—any fall-related accidents in our industry that we are aware of.

Chairman TALENT. I presume OSHA investigated that as part of the rulemaking. Do you have any comment on that or any information available for us?

Mr. SEYMOUR. Congressman, we will submit our responses for the record as quickly as we can when we get back.

Chairman TALENT. Well, then I will tell you what, I will just raise these points and maybe you could take them down and supplement the record later on.

Mr. SEYMOUR. Yes, sir.

Chairman TALENT. That is one thing that I am interested in. Another thing which I intended to ask the Secretary and just did not do, even though it was on my list, he made the point that he assumes no injuries resulting from compliance. These witnesses and others will make the point that there are injuries that occur when the workers trip over the lines. I think that is the most significant complaint.

I would like to know whether OSHA calculated that when it considered the impact. In other words, did you calculate the fact that having to wear these harnesses that much more often would actually cause some tripping kinds of injuries; and if so, how many you assumed it would cause? If you could, give us a record on that.

Patti, one thing I raised before, tell us what common instances in remodeling where this rule would apply now where it has not in the past? It is just a little hard for me to envision. I can see it in the housing, in the homebuilding and the manufactured housing, but in remodeling it is a little hard for me to see it.

Ms. BURGIO. Well, it is, I think, very hard for our members to understand as well, because there are really no exceptions; it applies to all construction including residential beyond the special appendix for new construction.

Where our members find confusion is that perhaps in doing a new addition, not really considered new construction because it is an addition to an existing home, yet it may include a roof, or obviously will include a roof. They are under the assumption that it will apply in those instances as well. The opening applications would apply to window replacement. They assume that the guardrails may apply to, perhaps, siding applications above 6 feet.

Chairman TALENT. If you are not working on a ladder. What about, like, if you are working on a staircase or something? I have heard also working on the second floor.

Ms. BURGIO. Those are covered under different subsections of the regulation.

Chairman TALENT. Also, if you all would give us for the record later on your comment on Ms. Burgio's statement that OSHA is telling the remodelers they have to control the subs that they use in this respect, and her concern that that caught them in a conflict because if they start controlling how the subcontractors are doing particular jobs, then they are not subcontractors anymore in the eyes of the IRS.

I would like to know whether the Agency is telling that to remodeling contractors, either formally or informally; and if so, what the Agency's position is with regard to the fact that these are subcontracting relationships, where they are not supposed to control that.

Mr. SEYMOUR. We will explain in detail our multiemployer policy worksite policy.

Chairman TALENT. That will be fine. Yes, and anything else you want to submit obviously we would be happy to have.

Do you have any questions?

Ms. VELÁZQUEZ. Thank you, Mr. Chairman.

First of all, I would like to comment on the CNN piece. I was very impressed about the 73-years-old man going up to the roof.

Ms. VELÁZQUEZ. But also I would like to add, Mr. Chairman, that I understand that OSHA has been working with the contractor featured on the CNN piece, and that they provided him with a sample plan that would enable him to protect workers with a minimum loss of productivity and is working with him to explore alternative practices that will help protect the workers.

Also, I would like to ask, Ms. Burgio, when you commented on the fact that some of the inspectors could not answer the what-if scenario, in light of your comments regarding the inability of these inspectors, as you put it, could you comment on Assistant Secretary Dear's explanation of the alternative plans that may be submitted by any of the contractors?

Ms. BURGIO. Well, because it is so open ended, our folks are not sure what alternative plans are available to them versus the fall-restraint systems. Our members feel that the safety net or the guardrail alternatives for personal fall protection are not viable alternatives in residential remodeling.

To set up a safety net or a guardrail system around a roof or window replacement area would disturb the homeowner's landscaping. That is something that seems much more obtrusive to the homeowner. Their assumption is that the personal fall restraint systems, the body belts and harnesses would be the choice. In using those they feel that—

Ms. VELÁZQUEZ. You know, in this business we cannot make assumptions. I just would like to know if you and your organization—

Ms. BURGIO. Well, they are not getting direct answers from the OSHA folks.

Ms. VELÁZQUEZ. They are not?

Ms. BURGIO. Those are the reports that I am hearing, that they cannot answer, "what if" this particular scenario or, "what if" in this instance. Which options should we use? I can only report what I am hearing from my membership.

Ms. VELÁZQUEZ. Mr. Chairman, I just would like for the some of the officials from the Department of Labor to react to her comments.

Mr. TALENT. Sure. You can either do it now or for the record. You did not come expecting to testify.

Ms. VELÁZQUEZ. Yes, sure.

Mr. SEYMOUR. We will do it in writing. Essentially, residential construction plans are available for any kind of residential construction, whether you are putting windows in, putting roofs on, whatever you are doing if the conventional systems are not appropriate for the kind of activity you are doing, you can use the alternative plan approach, so there is no limitations on it as it pertains to residential construction. We will respond back in writing.

Chairman TALENT. Could I ask him a question?

Ms. VELÁZQUEZ. Sure.

Chairman TALENT. When you say "residential plans are available," do you mean that the Agency has recommended plans or that

people can feel free to develop their own plans in lieu of using the protection equipment?

Mr. SEYMOUR. The standard allows flexibility to develop your own plan, but, as was indicated by Mr. Saslow, the Homebuilders have actually developed a model plan which we put into our standards as a nonmandatory appendix to give guidance to homebuilders who want to do that. You do not have to use that plan, but there is one already there, and you can just kind of tailor it to your needs. The standard allows the flexibility to develop your own plan for your own needs.

Chairman TALENT. If I could ask just one more question?

Ms. VELÁZQUEZ. Sure.

Chairman TALENT. That is like a safe harbor? In other words, if they follow that plan that you have listed, that you have in the regulation and comply with it, then that is a defense against any claim that they are in violation; is that correct?

Mr. SEYMOUR. That is right. The plan is an alternative to compliance with conventional systems, but you may not need to follow the whole plan. There is a variety of kinds of activities that are in the homebuilders plan that were put in there. They may only need one or two subject areas of that.

Chairman TALENT. I thank the gentlelady for yielding.

Ms. VELÁZQUEZ. Thank you.

Mr. Gilligan, you told our Chairman that you do not know how many people fell, or how many falls took place last year?

Mr. GILLIGAN. That is correct.

Ms. VELÁZQUEZ. You cannot predict how many falls may happen in the near future?

Mr. GILLIGAN. No. I cannot, no.

Ms. VELÁZQUEZ. I think that is why it is so important that we have these standards in place, because our responsibility is to protect those two guys, those two workers, who are up there on the roof working. I just would like to ask you, has your organization engaged OSHA in a dialogue to discuss your concerns? Did your organization submit any comments during the last 9 years to OSHA?

Mr. GILLIGAN. First, let me say I was not here 9 years ago when the rule was open for comment. We have a file policy in our office, we do not keep documents over 3 years. I do not know if we submitted comments 9 years ago. That was a long time ago.

In the recent reopening, it was not clear to us whether OSHA opened a very narrow reopening in the comment period. We read it to apply only to concrete and leading edge work, that it was not really a wide open reopening of the rule.

I think OSHA may have felt that negotiating with the National Association of Homebuilders—in that instance, they were only taking into account two-thirds of the residential construction. We make up the other third, and we were not granted that ability to negotiate.

Ms. VELÁZQUEZ. Mr. Gilligan, how long has the Manufactured Housing Institute been in existence?

Mr. GILLIGAN. Since 1945.

Ms. VELÁZQUEZ. Nineteen forty-five. The fact that you went in there 9 years ago it does not state that you—

Mr. GILLIGAN. No. What I was saying is that I personally do not know if MHI commented. I really do not know.

Ms. VELÁZQUEZ. Mr. Chairman, I would like to ask for the record if he could submit to us if there has been any dialogue at all in the last 9 years with OSHA and what has been the reaction or the response from OSHA to your institute.

Mr. GILLIGAN. There has not.

Chairman TALENT. Is that what you need, then?

You are saying that you have not submitted any comment.

Mr. GILLIGAN. There has been none.

Ms. VELÁZQUEZ. First, he said that he was not there 3 years ago, so he did not know. He does not know what happened prior to 3 years ago. I just would like to find out.

Mr. GILLIGAN. No. I said I was not there 9 years ago. I said 9 years ago when the comment period was open, or when the rule was first published I was not with MHI. I do not know whether MHI submitted comments 9 years ago or not. The most recent re-opening of the comment period I thought was limited to a very narrow set of—in other words, I do not think, and I may be wrong, I do not think OSHA reopened the whole rule several years ago for recommending.

Ms. VELÁZQUEZ. That is what I want to find out, and I am asking you.

Mr. GILLIGAN. Yes. I do not know if they did or did not. It was my understanding that it was a limited, that it was a narrow re-opening of the comment period.

Chairman TALENT. Well, the gentlelady is certainly entitled to know whether your Institute or your Association has submitted comments to OSHA during the course of the last 9 years regarding this rule. I presume somebody in the Association knows whether this was done.

You are asking whether if it was done, whether those could be submitted for the record.

Ms. VELÁZQUEZ. That is correct. I just would like to find out whether or not OSHA has been responsive.

Mr. GILLIGAN. I will attempt to find that out and will let you know if we did.

Ms. VELÁZQUEZ. Thank you.

Chairman TALENT. OSHA probably knows, too, so we could ask them.

Ms. VELÁZQUEZ. Yes, sure.

Chairman TALENT. That is another thing you might try to help us with, comments that the Manufactured Housing people have submitted.

Ms. VELÁZQUEZ. Yes. I also would like to submit to the record the Chicago Roofers Contractor Association has reported to OSHA that the Agency standard outreach efforts on enforcement program has helped to reduce the State's roofing contractor workers' comp rate by 4 to 5 points, a very substantial decline.

This association has promised to provide the Agency with specific data on this decline and on the resulting monetary savings. What I intend to clarify with this is the standards save lives and also save money, contrary to the statements have been made this morning here.

Chairman TALENT. I thank the gentlelady.

Do you want to comment on that, Mr. Good? Do you know about the statement the gentlelady has made?

Mr. GOOD. This is news to me. I would only comment, I guess, that since the standard only went into effect in February it would be very hard to document already a reflection in the workers' comp rates being reduced. I am quite confident the State of Illinois does not work that quickly in its workers' compensation rulings, but I would be very interested to see. It may be industrywide in safety, rather than specific to the fall standard, is what I would suspect. I would be very interested to see that however.

Ms. VELÁZQUEZ. Sure.

Chairman TALENT. Do you have any more?

Ms. VELÁZQUEZ. No. Thank you, Mr. Chairman.

Chairman TALENT. All right. I do not either, so I thank you so much, and we will go on to the next panel then. We have one more panel. We did that expeditiously. It is very easy when there is nobody here but you and me.

I thank these witnesses for coming, and many of you have come a long way. I will introduce all of you, and then we will hear your testimony. Mr. Douglas Jones, vice-president and chief operating officer of South Side Roofing Company from St. Louis, Missouri. It is very good to have you here.

Mr. JONES. Thank you, sir.

Chairman TALENT. You operate in a wonderful city. Everybody should visit it.

Mr. Robert Therrien. Do I have that right, sir?

Mr. THERRIEN. Yes.

Chairman TALENT. Vice-President of the Al Melanson Company, from Keene, New Hampshire; Mr. Reid Ribble, the president of the Security Roofing and Siding Company from Menasha, Wisconsin; and Mr. William Brown, production superintendent, Security Roofing and Siding Company from Menasha, Wisconsin.

All right, Mr. Jones, you can go ahead.

Again, I would ask you all if you can to summarize, and try to keep it under 5 minutes, so we can ask questions.

TESTIMONY OF DOUGLAS JONES, VICE-PRESIDENT AND CHIEF OPERATING OFFICER, SOUTH SIDE ROOFING COMPANY, INC.

Mr. JONES. Chairman Talent, and Ms. Velázquez, my name is Douglas Jones. I am vice-president and chief operating officer of South Side Roofing Company, Inc. Our firm performs both flat and steep work on residential, educational, commercial, and industrial buildings in the greater St. Louis Metropolitan area. During the past year, our company performed work on approximately 550 roofing projects.

Mr. Chairman, I am here to testify about the burdens imposed on contractors by OSHA's regulations, and in particular OSHA's new fall protection standard. Please don't misunderstand the intent of my remarks. I believe that there is a place for OSHA in our industry. The creation of OSHA was well-intentioned. However, bureaucracy has transformed OSHA into a liability rather than an agency that could be helpful to legitimate roofing contractors.

For example, up until approximately 6 years ago, I spent a considerable amount of my time estimating work. I was quite successful—bringing in anywhere from a quarter to a third of our annual sales volume. However, over the past 6 years my ability to estimate work has been severely limited to the point that I now have no time to estimate any work at all. This is due entirely to the necessity that I keep current with the increasing number of Government regulations, particularly those of OSHA.

Since I am no longer able to estimate work, our firm has been forced to hire another estimator to generate the sales. The cost of this estimator—including salary, benefits, payroll taxes, and insurance—is \$60,000 annually. During this past year, we have incurred \$35,000 in additional expenses related solely to OSHA. This money was spent for safety equipment, safety awards, and safety training. These two costs total \$95,000, which represents 11 percent of our overhead costs.

One cost that is not included in the above figures, and one that we foresee as a strong possibility, is increased workers' compensation claims resulting from adherence to the OSHA fall protection standard. Some of our employees are complaining of back strain associated with wearing full-body harnesses and others are complaining of tripping over lines laying on the roof to which the harnesses are attached. But for the fall protection standard, we would not be experiencing incidents of this nature.

How do we recover these additional costs? We include them in our proposal and try to pass them on to you and the public. But, our roofing prices are 11 percent higher than they would be if we were not obligated to conform to the multitude of OSHA regulations, and the public is reluctant to pay these higher prices.

In one instance, a customer of our firm questioned our price for reroofing his home. When I responded that we had to factor an additional 11 percent into the bid, he commended our dedication to safety, but replied that since this additional cost did not give him any more quality, he was not interested in paying it. We lost the job and our men lost the wages they would have earned had they performed the work.

This was particularly disconcerting because I knew my competitor who won the bid would not conform to OSHA regulations. This was, and is, not an isolated incident. Time and time again, I see work being performed by contractors who are making no attempt to conform to OSHA regulations. They realize that the chances of being inspected and cited are small, so they are willing to ignore these regulations.

One example of the extent to which contractors flagrantly disregard the OSHA standards was apparent to me during my visit to Washington this past April. By walking past the outside steps leading up to the House Chambers, I noticed workers in the process of removing and replacing the steps. I counted four violations of the OSHA standards:

First, ladder did not extend 3 feet above the landing; second, workers were engaged in work on levels not protected by guardrails; third, workers were standing on top of guardrails while performing work; and, fourth, workers, while not wearing hard hats, were directly below the area in which others were working.

I might add, parenthetically, that yesterday as I was waiting to catch the Metro over at National, I was watching the work being performed on the new terminal and saw another three violations of the OSHA standards.

In the private sector, conscientious contractors and their personnel are losing work because the public generally does not want to pay the cost associated with conforming to the regulations. Non-conforming contractors are gaining work because of the advantage realized by not factoring in these costs.

Furthermore, our employees strongly object to our policy requiring them to wear the full-body harnesses mandated by the fall protection standard. They believe that the clutter created when the safety lines are spread across the roof is more of a threat to their safety than the height at which they are working, especially when they are working at heights of less than 16 feet.

Also, they ridicule the OSHA requirement that a hole 2 inches by 2 inches either be covered or be guarded by guardrails. The people whom the regulations are intended to protect have no respect for the regulations, because they believe them to be hazardous and impractical.

Mr. Chairman, I firmly believe that OSHA's fall protection standard must be reviewed and modified to emphasize practical guidelines and to eliminate impractical requirements that are ignored by many, ridiculed by the average worker, and not enforced. Until that occurs, your active involvement to help us remedy this situation is appreciated.

Thank you for your attention. If you have any questions, I will be happy to answer them.

Chairman TALENT. Thank you, Mr. Jones. You may want to freelance for OSHA as an inspector.

The Agency may want to consider that kind of an arrangement. Mr. Therrien?

[Mr. Jones' statement may be found in the appendix.]

TESTIMONY OF ROBERT W. THERRIEN, JR., VICE-PRESIDENT, AL MELANSON COMPANY, INC.

Mr. THERRIEN. Good afternoon. My name is Robert Therrien, Jr. I am vice-president of the Al Melanson Company. We are roofing, environmental, and acoustical contractors, as well as metal fabricators from Keene, New Hampshire. We also have four affiliate offices throughout New Hampshire and Vermont.

Mr. Chairman, I am here this morning to briefly talk about our experience with OSHA's fall protection standard. The new standard requires the fall protection devices be used whenever an employee is at a working height greater than 6 feet. It has changed equipment requirements, forcing us to purchase full-body safety harnesses—in lieu of belts that we already own—shock absorbing lanyards, and additional staging, as well as wall brackets.

In order to illustrate the problem from a personal perspective, I would like to run through three separate OSHA inspections that occurred on April 20, 21, and 26 of this year at one of my company's job sites. This project was a multibuilding retirement community that is being built in Peterborough, New Hampshire. During

the first two visits, the OSHA inspector inspected the roofers in conjunction with a visit to several other trades on the job site.

After reviewing our safety equipment, particularly fall protection, and verbally questioning our employees, he found no problems and no citations were issued. At this point we began to feel the money we had spent was well-spent on all the fall protection equipment that we had to purchase, and it was worth the expense, aggravation, and burden. However, we soon learned that this was not the case.

Believe it or not, within a 1-week period the same OSHA inspector returned for a third visit to our job site. While driving his car to the job site, the inspector videotaped men on one of the roofs on this project. But the distance from which the filming was taken was so far away that our safety director, when he went to view the video, noted that neither he nor the OSHA official could tell who the men were.

Mr. Chairman, at this point I would like to ask two questions: First, if you cannot identify the employees from the distance, why film them? Second, who was more unsafe in this situation—the men who were on an easily walkable 6 in 12 roof surface or the OSHA official driving down the road videotaping out the side window of his car? By the way, we believe the men that the inspector videotaped were not employees of our company.

When the OSHA inspector arrived on the job site to take a closer look, he cited us for two violations of the fall protection standard. We were cited for \$500 for improper installation procedure of anchoring brackets used for tying off. According to the inspector, our worker installing the fall protection brackets was not properly tied off.

Let me explain that implementing the work practice that the OSHA official demanded would require a roofer to use two lifelines while installing the brackets: After installing the first bracket, one line would be tied off; then after installing the second bracket, the worker would tie off to that bracket, walk back to the first bracket, untie, walk back past the bracket he had just installed, install a third bracket, tie off to that, walk back to the previous bracket, untie, walk past the third bracket, and et cetera.

This is a cumbersome, tiring, and redundant work pattern on a shallow roof slope that is unacceptable to my employees. In addition, our foreman was questioned by an OSHA inspector about the methods we used to roof a back side of another building and what types of fall prevention devices were utilized. A foreman explained that we had used pipe staging on that building as a fall protection system.

The inspector then asked how we got onto the staging, and my men stated that we had set a ladder up to a flat roof below this area, walked across a portion of the flat roof to the staging, then up the staging onto the roof surface. Upon inspecting the flat roof area, the inspector discovered unsecured roof opening covers on portions of the roof.

Please note that we had completed our work on this building, but because of the unsecured holes on this roof—installed by another contractor and the responsibility of another contractor—we were still cited and fined \$900.

Mr. Chairman, a safe worksite has always been a priority for my company. In fact, the project's general contractor has used us, and is still using us, as a company, as a model for safety procedures and has asked other contractors to follow our policies. Yet, we were still cited and fined excessively by OSHA, when other contractors on the same site were not.

For example, it is my understanding that a small framing contractor was installing plywood decking on another roof in the same area where the OSHA inspector was evaluating compliance. These men were carrying sheets of plywood around without any fall protection equipment at all. Their citation was only \$150.

Does this type of inspection and selective citation policy improve protection and safety on the worksite? In my opinion, the answer is a categorical no—it only further demoralizes my crew, who feel they have done nothing wrong.

I applaud the subcommittee's decision to hold a hearing on this timely issue, and I would be happy to answer any questions.

Chairman TALENT. Thank you.

Mr. Ribble?

[Mr. Therrien's statement may be found in the appendix.]

TESTIMONY OF REID RIBBLE, PRESIDENT, SECURITY ROOFING & SIDING COMPANY

Mr. RIBBLE. Chairman Talent and Ms. Velázquez, my name is Reid Ribble. I am the president of the Ribble Group, Inc., which operates two small roofing companies in North Central Wisconsin.

Our companies complete approximately 250 roofing projects each year. I am here to testify about my concern for the new OSHA fall protection standard. This past February OSHA issued a new standard, safety standard, that is intended to reduce injuries that result from falls. I support that goal. As a second generation roofing contractor, I am fully aware of the risks involved in my trade.

However, falls are not a common occurrence. In the last 10 years, my company has only experienced one lost time accident from a fall. This occurred in the spring of 1994, when an employee fell from a ladder. His fall was caused by his violations of our safety policies and training, and the new regulations would not have protected him.

My company takes safety seriously. Although not required by any agency, we have taken it upon ourselves to conduct mandatory, weekly safety meetings for all field personnel. In addition to providing extensive training in safety and safety awareness, my company provides safety equipment in excess of what is called for in all situations.

Mr. Chairman, I do not feel that my company is unusual in this regard. Small businesses are dependent upon their employees. Even one injured person can have a significant impact on the entire operation. I know each of my employees personally, and their health and safety is my personal concern.

The new OSHA fall protection standard, though well intended, has had a dramatically negative effect on my company's performance and safety. Already this year, we have had two accidents—each of them falls, I might add, resulting in injuries to elbow and

knee joints—because employees have tripped on the ropes designed to protect them.

We have also experienced a significant cost increase. So far, we have invested \$410 per employee for the harness, lines, and lanyards. We must also purchase attachment anchors that can cost anywhere from \$65 per project to as much as \$300 per project, depending on the type of roof.

Even more disturbing is that my company is experiencing a production loss. Compared to the first quarter of 1994, my company is now installing 27 percent fewer square feet of roofing—even though I have the same number of employees.

What does this mean for the homeowner? Well, I estimate that the additional cost to the typical Wisconsin homeowner reroofing his or her home is \$300. Mr. Chairman, this regulation is an unfair burden on my company and on American consumers.

Let me give you one more example about how this regulation is affecting my company. In 1993, our “close-ratio,” that is the ratio of jobs that we sell versus the ratio of jobs that we estimate, was 1.9 out of 10, 19 percent. In 1994, the number was 2.2 out of 10, 22 percent. So far in 1995 our close-ratio is 0.6 out of 10, 6 percent.

This dramatic decline in my company’s sales is, in my opinion, directly related to the “pass through” of costs with our compliance to the new standard. This lost business is going to roofing contractors, many who operate roofing companies that are as large or larger than mine, who offer little or no protection to their employees and who flaunt the law with impunity. Those contractors operate in this manner, because OSHA is unable to adequately enforce this standard.

Typical roofing projects are of short duration. They last from one to 3 days. Most roofing projects will be completed without a visit from OSHA. My competition knows this and, for the most part, chooses to take its chances. They have been rewarded, and I have been victimized by my sincere attempt at compliance.

This causes me great concern and should cause you concern as well. Nothing is gained when safe, professional roofing contractors are losing jobs. Companies like mine should be applauded for their safety records and encouraged to do even better, but the new OSHA fall protection standard has had the opposite effect. It has insulted my employees, who for years have taken pride not only in their workmanship but in their ability to complete their work in a safe fashion. Mr. Chairman and members of the subcommittee, I implore you to help us find remedies.

I appreciate this opportunity to address the subcommittee today and I would be happy to answer your questions.

Chairman TALENT. We appreciate you being here.

Mr. Brown?

[Mr. Ribble’s statement may be found in the appendix.]

TESTIMONY OF WILLIAM BROWN, PRODUCTION SUPERINTENDENT, SECURITY ROOFING & SIDING COMPANY

Mr. BROWN. Chairman Talent, members of the subcommittee, my name is Bill Brown. I am the production superintendent for Security Roofing, in Menasha, Wisconsin. I have worked as a roofer for owners Reid Ribble and his brother Rick since I was 19 years old.

I enjoy my job, and I take pride in what I do. I am here today to testify about how the newly fall protection standard has affected my job.

OSHA claims that this new standard will prevent falls, but I am here to tell you that it will cause them. I am mostly here to tell you how roofers I work with every day feel about this standard. I want you to know how this regulation impacts me and countless others like me. But, first of all, let me explain why I find it insulting.

I have dedicated my life to learning what, I feel, is an honorable trade. I do my job well, and I am fully aware of the risks. In short, I think I know more about roofing safety than OSHA. Every day I work side by side with roofing experts who are aware of the dangerous of working at elevated heights. It is this awareness when combined with safety training that helps us keep safe.

Freedom to move about on a roof unencumbered is the key to a safe environment. Common sense dictates that when roofing safety lines are laying on the surface of the roof and roofers are moving about, the odds of tripping and falling increase. This, in fact, has been the case. We have already had two falls directly caused by safety lines this year. These accidents really happened and had to be issued into the official OSHA log. One roofer twisted his knee, stepping on a rope, and another injured his elbow tripping over a rope.

Now, please stop and consider this hypothetical scenario. A roofer is carrying a bundle of shingles across a ranch-style home. Suddenly the roofer trips on his safety line, near the edge of the roof, is caught by a lifeline, like a pendulum on a clock is thrown through a picture window.

Roofers like myself were never consulted by OSHA before this regulation was issued, and I have been victimized by bureaucrats in the conduct of my daily activity. I know what it takes to have a safe work environment, and I would have been happy to tell them. I will sum this up in one sentence: Safety training, combined with common sense, will do more to minimize the number of roof-related falls than all the well-intended regulations of OSHA.

I thank the subcommittee and will be happy to answer any questions.

[Mr. Brown's statement may be found in the appendix.]

Chairman TALENT. I thank you all for your testimony; it was very compelling.

Do you have any questions, Ms. Velázquez?

Ms. VELÁZQUEZ. Mr. Jones, I commend you for your desire to protect your workers. Could you tell us how much do you expect to spend on new safety equipment this coming year?

Mr. JONES. Probably not quite as much. We just went out and purchased a piece of equipment the other day, and I do not have the cost of that, but it is a rolling scaffolding that we can set up along side of a building. We bought one piece just to see how it works, and if we can incorporate it into our program, we intend to buy more.

Right now, we have the retractable lifelines to which the full-body harnesses are attached. We will probably be buying more of those at a cost of about \$1,200 a piece, I believe. Until we have ex-

plored all the different pieces of equipment out there and purchased everything we feel is necessary. We are still going to be investing over the next year or two to increase our inventory of equipment to the point that we have everything covered.

Ms. VELÁZQUEZ. Basically, we could say that the cost that you incurred is not a yearly investment cost?

Mr. JONES. No. In this fiscal year, it is a yearly investment cost, but if you want to amortize it over years—

Ms. VELÁZQUEZ. You do not have to buy next year the same kind of equipment that you bought this year.

Mr. JONES. We will be buying probably a different type of equipment. If this rolling scaffolding works, we will be going from the full-body harnesses that we already have a supply of probably to more sophisticated, as some of this rolling scaffolding.

Also, I might add that with respect to the full-body harnesses and the lines, the recall mechanism, or the retracting mechanism, on that equipment has to be recertified every year according to OSHA. We have not had that equipment a year yet, so we have no idea what that is going to cost. Also, as the years go by, we will have to buy pieces, or new equipment to replace those that have broken or just begun to fail.

Ms. VELÁZQUEZ. Mr. Chairman, it troubles me that every time that we hear a witness that they come up with different figures. I hear from OSHA that the requirement in purchasing equipment to comply with the regulation is no more than \$300.

Mr. SEYMOUR. There are some systems that you can buy that will meet the requirements, personal fall-arrest systems, that cost that kind of money.

Ms. VELÁZQUEZ. I have here from the Washington Roofing Products Corporation and from Deson Control two different estimates that goes not more than \$200. I do not know why it is that there is such a big difference, there is such a big gap, between what you presented, between what OSHA is telling us and what these estimates are telling us.

Chairman TALENT. Do you want to put those in the record?

Ms. VELÁZQUEZ. Yes, sure.

Chairman TALENT. They will be in the record.

Ms. VELÁZQUEZ. Thank you, Mr. Chairman.

[The information may be found in the appendix.]

Mr. RIBBLE. May I address that question?

Ms. VELÁZQUEZ. Yes.

Mr. RIBBLE. The reality is there are several different ways, there are several different types of fall-arrest equipment, and they vary in price anywhere from \$200 to over \$1,000 per attachment point or per employee, let's say. Depending on the weather conditions and environment that you are working in, the slope and pitch of the roof, certain attachment methods are better than others.

We work in an area that the temperatures are a little cooler for most of the year, and it was better for our employees to buy a body harness that was more of a canvas type that, completely surrounding their body. You cannot buy that for \$200. If you have a case or a place that I could, I would like you to submit it to me, because I could appreciate the savings. But we cannot.

Ms. VELÁZQUEZ. Well, maybe OSHA could provide you with that information where you could purchase this equipment in some areas where it will be less expensive.

Mr. Ribble, have you had any dialogue with OSHA pertaining to your concerns?

Mr. RIBBLE. Yes, I have.

Ms. VELÁZQUEZ. What has been the response and responsiveness?

Mr. RIBBLE. The responsiveness has been very good. I have appreciated the conversations that I have had with OSHA; although, we have not yet reached resolution. I am encouraging them to reach resolution quickly, at least come up with an alternate plan that we can find that is workable over the short-term, but I think this is a long-term problem. Short-term solutions will help me today, but I would hope that a long-term solution could be reached. I do not know what that will be yet.

Ms. VELÁZQUEZ. Do you agree with me that the OSHA that you are dealing with today is more flexible?

Mr. RIBBLE. I will agree with you that the OSHA in Washington, DC, that I met was more flexible than I expected. As a matter of fact, a comment I made to Mr. Dear before he left was I hope he can reinvent his compliance officers to match. That has not been our experience yet.

Ms. VELÁZQUEZ. I just would like to hear from any of the panelists here. Have you submitted any alternative plan to comply with the standard?

Mr. RIBBLE. No, we have not. The alternative plans, I believe, only apply to residential construction. Most of our work is commercial, so we would not be able to do that.

Ms. VELÁZQUEZ. OK.

Thank you, Mr. Chairman.

Chairman TALENT. Thank you. Can I see those invoices? I want to get at this cost thing a little bit. Let me see if I can go over some of these, and you guys could perhaps comment on some of these prices. This is from Deson Control Company in Warrenton, Pennsylvania. I wonder whose district that is? Waste belts, \$25 to \$50 each. Are those the prices you are facing?

Mr. RIBBLE. Yes, that is right. But I can tell you this, OSHA has already decided to eliminate waste belts from the standard.

Effective in a year or so?

Mr. JONES. January 1998. We do not have any waste belts. We buy the full-body harnesses, because we want our people to get used to is, so when January 1, 1998 hits—

Chairman TALENT. Will they have full-body harnesses for \$40 to \$80 each? Is that the cost you are looking at?

Mr. JONES. That is a little cheap. Ours are costing over \$100, about \$125.

Chairman TALENT. Rope grabs, \$40 to \$80 each, or with integral lanyards add \$25 to \$50 if they have integrated lanyards. Is that about what you are paying?

Mr. THERRIEN. Yes.

Chairman TALENT. Lifeline, \$15 to \$60 per 50-foot length. Is that about what you are paying?

Mr. THERRIEN. Yes.

Chairman TALENT. Anchor connectors, \$10 to \$25 each?

Mr. RIBBLE. You need two to three per project.

Chairman TALENT. I do not know whether I can understand that. What I would like to do is to get you all copies of this, and then you can comment on it, the extent to which you think it is accurate or it understates the cost. What I am hearing you all say in your testimony is that the \$250 per employee figure that OSHA has estimated is simply much lower than you are experiencing. I mean, is that correct?

Mr. JONES. That is correct.

Chairman TALENT. It is costing you each more than that?

Mr. JONES. That is correct.

Chairman TALENT. It would be good to try to pin that down, if possible. The other thing, I just wanted to give you an opportunity to elaborate a little bit, Mr. Brown, because you really, I think, more than anybody else who has testified—you are out there on the roofs. You have done it and you supervise it now. You seem pretty definite in your belief that this would end up causing more injuries than it saves.

Mr. BROWN. I am sure that it will. I have had at least two or three experiences myself where, for instance, you tie off the top of the roof. You work your way down the roof with a rope grab, and set your rope grab so that it will not let you get over the eve. There are two or three other people on the roof at the same time while you are doing something, and meanwhile they will cross your line.

You go up to get something and you come back down. Now your line is maybe a foot to two feet shorter, and now you are a foot away from the edge. Rather than go up and correct it, which you would do normally, but say it happens within minutes. You are sitting there and you tug on it, and you do not have that slack anymore.

Now you are working a foot away from the edge without that slack, and so you get used to that. Then the person goes over the line, and boom, you have got an instant foot that goes back, that you have back on you. This happens constantly with multiple people on the roof.

Chairman TALENT. You are saying, then, if I take it correctly, not only the risk of minor injuries is aggravated but the risk of series injuries would be aggravated?

Mr. BROWN. Well, you probably would not fall off of the roof because you are still not going to get past the eve. I am saying you get used to a situation that changes throughout the day, because of people overlapping lines and carrying things from one position on the roof to the other. Nothing stays constant when you have got these lines laying on the roof.

Chairman TALENT. Give me an idea, how much does this slow-down people in doing roofing work? Would an average job take half again as long?

Mr. BROWN. I would say from a third to a half would be a pretty good estimate. If you have an average roof where you would not use it, you could be in and out of there. If you have three people on it and you have to use it, I would say a third to a half would be, I think, a pretty good estimate.

Chairman TALENT. In terms of the roofing business, before this went into effect, do roofers do a lot of work at above 16 feet, so that you were subject to something like this before in a substantial part of your business, or is this something you never really dealt with?

Mr. BROWN. Some but not the bulk of it. The bulk of most eve height that I have been related to on the residential part of it is below the 16 feet, where you would not have to take any of this into account.

Chairman TALENT. Well, yes, because one of things that, I think, is fair to raise on OSHA's behalf is that you have testified that this increases costs a lot and causes lost productivity. Frankly, that seems very plausible to me. I mean, I really think you have got the better of that argument. On the other hand, you all do seem to be telling us at 10 feet, it would be OK.

Now, I know you are not, Mr. Brown. You probably have not been involved specifically in those negotiations. People seem to be saying, "Well, at 6 feet we do not like it, but at 10 feet we could live with it." What is the difference between 6 feet and 10 feet? Do any of you guys want to comment on that?

Mr. JONES. I have not said I could live with 10 feet.

Chairman TALENT. OK.

Mr. BROWN. I would think it would make more consideration, if you took into consideration the slope of the roof versus the eve height. If you look at an A-frame, which could have an eve height of 4 feet off the ground, but could have a 12 pitch. You are a lot more likely to fall off of an A-frame than you are of a ranch house that has got an 8-foot eve height.

Chairman TALENT. In your view it is not so much the height but other conditions regarding the job that would make it more or less difficult?

Mr. BROWN. Well, the slope has got to be taken into consideration with the height. As the slope gets greater in our industry, people will take more protection from falling. You do not feel comfortable. When you get up around 8, 10, 12, you have to do something, because you cannot walk those anymore. In the bulk of the work that we do that is below the 16 foot level and between the 4:12 and the 6:12, it is not necessary.

Chairman TALENT. All right. One other question to you all. OSHA has said in their analysis of the regulatory impact of this that actually this would be a great boon to you, because it would save a couple of hundred million dollars nationally in productivity and cost associated with injuries. It does not sound to me like you all have yet experienced any of those wonderful gains. Is that correct?

Mr. JONES. That is correct.

Mr. THERRIEN. I have not realized any.

Mr. RIBBLE. That is correct. There is a good chance that by the end of the year my safety modifier will actually begin to go up, and my workman's comp will increase. That is my personal belief.

Chairman TALENT. Because of the injuries that are occurring?

Mr. RIBBLE. Because of injuries related to falls. I mean, just look below us here with all these cords and imagine that is ropes on a roof. When you have five or six workers on there, these guys have to traverse back and forth across that roof.

Chairman TALENT. Mr. Jones already testified that we have not been used in the Capitol to complying with OSHA requirements. That changed earlier in the year, and I am waiting for the first host of inspectors to descend on the Capitol.

Mr. JONES. I will be willing to do it for gratis.

Chairman TALENT. I thank you all for being here.

Do you have any more?

Ms. VELÁZQUEZ. Yes. Mr. Chairman, I just would like to share with this subcommittee. This stack represents all the accidents investigated by OSHA, where a construction worker within the last 5 years was either injured or killed in a fall. I am very much concerned about changing from a 6-foot standard to 10. I think that is not how high up you fall, but how you fall. I just would like to ask you to remember the experience that we just recently had with Christopher Reeve; it was less than 5 feet.

Thank you, Mr. Chairman.

Chairman TALENT. We will note that for the record. I again want to thank all the witnesses for being here. Some of you have traveled an awful long way, and I know you are very busy people and we do appreciate it. I want to thank the staff from OSHA for spending so much time with us.

Thank you all.

[Whereupon, at 1:30 p.m., the subcommittee was adjourned, subject to the call of the chair.]

APPENDIX

TESTIMONY OF CONGRESSMAN TOBY ROTH
ON THE OSHA FALL PROTECTION STANDARD
HOUSE SMALL BUSINESS COMMITTEE
June 15, 1995

Mr. Chairman, you and I know that our government is too big, and it costs too much. The new OSHA Fall Protection Standard is the perfect example.

I recently held a series of town hall meetings in my district, and let me tell you, people are upset. At every one of these meetings, I heard cries for help from hard-working Americans who are being harassed by the federal government.

In particular, OSHA's rule requiring homebuilders to use a net or mountain climbing harness when doing construction over 6 feet has them up in arms, and rightly so.

It means that if you are working on a small, 2 bedroom home, the site must be encased in a net. Or, if you are putting shingles on a roof, you must wear mountain climbing equipment. If you don't, OSHA will fine you \$1,000.

Now, this kind of regulation makes sense when you're constructing a high rise or a commercial building, but a house?

This requirement, like so many others, is both expensive and unnecessary.

What's worse, this rule was enforced and offenders were fined the very day it went into effect. Our local OSHA office hired extra enforcers and started issuing thousands of dollars in tickets immediately.

They are wasting their time and our tax dollars on this kind of thing, when they should be out looking for real hazards and safety problems.

This new regulation is Big Government at its worst. It's expensive; it's unnecessary, and it makes little sense. The only other thing I've ever heard of that even compares is OSHA's 1991 declaration that bricks are poisonous. That mistake was finally repealed in 1994. Let's not wait that long this time.

Mr. Chairman, we have got to put a stop to this kind of ridiculous over-regulation right now, and return some basic common sense to government.

HOUSINGNEWS

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HOME BUILDING INDUSTRY NEEDS WORKABLE OSHA FALL PROTECTION STANDARD

WASHINGTON, June 15 — The regulation that the Occupational Safety and Health Administration (OSHA) expects home builders to comply with to protect workers from falls during construction places a tremendous compliance burden on the average builder, the National Association of Home Builders (NAHB) today told Congress.

"The fall protection regulation written for the construction industry is costly, complex and too stringent and in some cases may even create hazards for workers," Howard Saslow, a builder from Columbia, Md. testified today before the Subcommittee on Regulation and Paperwork of the House Committee on Small Business. Although OSHA has made strides toward recognizing home building as a trade distinct from commercial construction, Saslow said, compliance with the revised regulation is impractical and nearly impossible.

"The regulation must be changed so that it offers worker protection while not driving small builders out of business," Saslow said.

For example, the new regulation requires employers to provide fall protection for workers exposed to fall hazards of six feet or more. Because virtually all elevated work in home



Building the American Dream

building is above six feet, employers must comply with the regulation by somehow controlling the fall hazard. The costs of doing this are onerous and the benefits questionable, Saslow told the committee.

"Personal fall arrest systems that adequately restrain a worker cost about \$350 per worker while more sophisticated retractable lanyard systems for tile roofing construction cost about \$1,000 per worker," he said. "So the small builder in Florida with six workers would have to invest approximately \$6,000 in fall restraint systems, even though his roofs have angles of only 19 degrees and historically have had minimal fall protection concerns."

The requirements for fall protection must be reviewed by OSHA, Saslow said, "so that the financial impact on small builders does not outweigh the perceived safety benefits."

If common-sense changes are not made to the standard, Saslow said that NAHB would ask Congress to require OSHA to make the changes statutorily as part of the OSHA reform package slated for full House consideration later this year.

NAHB recommends the following modifications:

- Eliminate the need for a site-specific fall protection plan.
- Transfer the burden of proof for infeasibility and greater hazard to OSHA.
- Raise the height definition of a low slope roof.
- Raise the height requirement for personal fall arrest systems from six feet to 18 feet.
- Raise the height requirement for non-roofing activities from six feet to 10 feet.



OPENING STATEMENT BY
WILLIAM BROWN
OF THE
NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
BEFORE THE
SUBCOMMITTEE ON REGULATION AND PAPERWORK
COMMITTEE ON SMALL BUSINESS
U.S. HOUSE OF REPRESENTATIVES
CONCERNING THE
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S
NEW FALL PROTECTION STANDARD

JUNE 15, 1995

Chairman Talent and Members of the Subcommittee, my name is Bill Brown. I am the Production Superintendent for Security Roofing in Menasha, Wisconsin. I have worked as a roofer for owners Reid Ribble and his brother, Rick, since I was 19 years old. I enjoy my job and I take pride in what I do.

I am here today to testify about how the new OSHA Fall Protection Standard has affected my job. OSHA claims that this new standard will prevent falls, but I am here to tell you that it will cause them. I am also here to tell you how roofers I work with every day feel about this standard.

I want you to know how this regulation impacts me and countless others like me. But, first of all, let me explain why I find it insulting. I have dedicated my life to learning what I feel is an honorable trade. I do my job well and I am fully aware of the risks. In short, I think I know more about roofing safety than OSHA.

Everyday I work side by side with roofing experts who are aware of the dangers of working at elevated heights. It is this awareness, when combined with safety training, that helps keep us safe. The freedom to move about on a roof, unencumbered, is the key to a safe environment. Common sense dictates, that when roofing safety lines are laying on the surface of the roof, and roofers are moving about, the odds of tripping and falling increase. And this, in fact, has been the case. We have already had two falls directly caused by safety lines this year. These accidents really happened and had to be entered into the official OSHA log. One roofer twisted his knee stepping on a rope and another injured his elbow tripping over a rope.

Now, please stop and consider this hypothetical scenario. A roofer is carrying a bundle of shingles across a ranch-style home. Suddenly the roofer trips on his safety line near the roof edge, is caught by his lifeline and, like a pendulum on a clock, is thrown through a picture window.

Roofers like myself were never consulted by OSHA before this regulation was issued and I have been victimized by bureaucrats who know little of my daily activity. I know what it takes to have a safe work environment and I would have been happy to tell them. I will sum this up in one sentence. Safety training, combined with common sense, will do more to minimize the number of roof-related falls than all the well-intended regulations of OSHA. I thank the subcommittee and would be happy to answer questions.

**Statement of
Patti Burgio, Government Affairs Director
of the
National Association of the Remodeling Industry
before the
House Small Business Subcommittee
on Regulation and Paperwork
regarding the
OSHA Fall Protection Standard
June 15, 1995**



Mr. Chairman, honorable members of the Subcommittee, thank you for inviting me to provide testimony regarding implementation of the new OSHA Fall Protection Standard. Our members have never been so verbal in their dismay over a federal rule, with the possible exception of the OSHA Hazard Communication Standard issued in 1988.

NARI is a not-for-profit trade association with nearly 6,000 member companies nationwide, representing more than 40,000 remodeling industry professionals. NARI members include residential home improvement contractors, national manufacturers, and distributors of home improvement products and services. The typical remodeler member has been in business more than five years, has fewer than five employees, and generates less than \$250,000 in sales each year. These are very small businesses.

However, residential remodeling constitutes a \$100 billion industry that has grown over 130 percent in the last ten years. OSHA's new fall protection standard has had a tremendous impact on these very small businesses, one that we believe was not accurately accounted for in the drafting of the regulation.

With more than 50 years of experience, NARI is committed to enhancing the professionalism of the remodeling industry and serving as an ally to homeowners. NARI is dedicated to the growth and betterment of the remodeling industry and related small businesses. That is why we greatly appreciate the opportunity, Mr. Chairman, to appeal to this subcommittee and the entire Congress to review and reconsider the value and rationale of this onerous regulation.

OSHA's revision of its fall protection standard in construction from the previous 16 feet to the current six feet has caused an unprecedented uproar in the NARI membership ranks.

NARI was not involved in the regulatory rulemaking as were the roofing contractors and others. The initial NPRM preceded my tenure at NARI. As I understand it, the rulemaking process was dragged out over a number of years, fading in and out of public review. It appears that little heed was paid to industry input beyond the special appendix developed for new home builders, which I hear is very difficult to use. When the final rule was issued in August 1994, we were somewhat shocked, having only learned of it after the fact. Immediately, we notified our members of its impact and effective date. But naturally, it did not sink in for many members until February 6, 1995 was upon them.

I called OSHA in September of 1994 to ask whether they would be preparing a "plain language" version of the rule that we could distribute to our members. I am certain our members do not receive the Federal Register nor would they find it very easy to read or understand. I was told to call back in January 1995. I did; then I was told that their publication funds had dried up and it was very unlikely that a user-friendly pamphlet would be produced at all. Much to my surprise, OSHA published this pamphlet in early May, two months after the effective date.

We have requested and received a limited number of copies and distributed them to our 80 local chapters. I fear there are many rank and file members, and thousands of nonmembers, who are still unaware of the specifics of the rule.

I conducted a survey of my key contacts, with whom I have regular communications, regarding some basic questions about the new rule.

- ▶ Ninety-four percent of the respondents heard about the new rule, though not the specifics.
- ▶ Forty-eight percent heard about the rule from NARI, either from my update, our monthly newsletter, or at a chapter meeting. Another 20% heard about it through the grapevine. And another 15% read about it in a trade magazine, perhaps as a result of a NARI press release.
- ▶ When asked whether they believed OSHA did an effective job publicizing the new rule, 88% answered NO.
- ▶ Nearly 40% had requested information from OSHA, yet only 35% of those who received OSHA information found it helpful.
- ▶ I then asked for an estimated per-worker-cost for compliance with the new rule including equipment, training, and internal inspection costs. The responses ranged from \$300 to

\$5,000. The average was \$1,433 per worker. This figure does not include an estimate for lost production time and lost remodeling projects due to the cumbersome and costly nature of the regulation.

- Finally, I asked for an estimate of the cost of compliance as a percent of their companies total revenue. Again, the range was wide, and depended upon the percent of exterior and elevated work each company undertakes. The average cost for compliance was 6.8% of total revenue.

This figure is far greater than that reached by OSHA in its Regulatory Flexibility Act analysis. OSHA estimated that "compliance costs represent less than 0.01% of total construction revenues and less than 0.05% for each individual construction sector." (59 Federal Register 12, pg.40725)

OSHA's figures may be true for multimillion dollar construction companies, but the rates are much higher for small remodeling companies, such as those I represent. For example, if a company had three affected workers and the equipment cost \$500 per worker, then the total company expense would be, at a minimum, \$1,500. If this expense figure is to account for only 0.05% of the company's total revenues, then each employee would have to generate \$1,000,000 in revenue. This is extremely unlikely in residential remodeling.

Further, OSHA concluded that the impact of the revised rule "will not have a significant impact upon a substantial number of small entities." A near 7% percent increase in overhead can easily put a strong remodeling company out of business. I am certain a young company will have a much more difficult time absorbing these expenses and passing them onto the consumer. Profit margins for smaller remodelers often hover around 5%.

OSHA estimates that this new rule will result in the prevention of 22 fatalities, assuming 100% compliance. However, I do not believe OSHA anticipated nor accounted for the distinct possibility of increased accidents and injuries due to the cumbersome nature of the required equipment. Entanglement of lines is a recurring concern voiced by the industry.

So what really happens when an expensive rule such as this is issued? What does this do to the economics of remodeling? Some of the larger, more established firms have the resources and will comply. They will take on the added costs and attempt to pass them onto the consumer. Others will press their luck and ignore the rule until they get caught. Firms in compliance will have difficulty competing with those who fail to comply. The lack of consistent OSHA enforcement will lead them to wonder why they are complying at all. Homeowners are unlikely to support the higher costs of the company in compliance when there are others who can do the same job at a lower cost. Is the public willing to pay the added costs? My reports from the field say NO because it does not add value to the service or product.

Despite the logistical problems and underestimated costs, the number one concern for our members is that we have been told by OSHA personnel that the general contractor is responsible for the safety of all the independent or subcontractors on the job. If the general contractor supervises or instructs the subcontractor as to the ways and means of doing the job safely, the IRS would classify that subcontractor as an employee for federal tax purposes. This OSHA-created responsibility for fall protection creates an employer-employee relationship, according to IRS rules, thus opening another can of worms for the general contractor. As you know, the status of independent contractors is a major concern of our industry. Conflicting government regulations will only add to the confusion.

Our friend, Wayne Kaufman, of United Homecraft in St. Louis, reports that, "This is a big, big problem for those of us who use independent contractors. If they are not in compliance, then they should be the ones who are cited. The fines and penalties should not escalate up to the general contractor." On behalf of the members of Greater St. Louis NARI, Wayne states, "While we support the intent to create safer workplaces for our workers, we are bombarded by complaints that the protective gear is actually causing more accidents. We are not certain that this rule works."

Remodelers have a number of built-in incentives to provide safe workplaces for their workers: 1) good workers are hard to come by, 2) their reputation would be tarnished by unsafe conditions or a history of accidents, and 3) their insurance rates would go through the roof (please excuse the pun) if there is an accident on the job.

I would like to share some other comments I have received since February:

"OSHA might as well make it a one-foot rule, because there is little work to be done under six feet in remodeling a house; even ceiling plates are eight feet or higher."

"The recommended contraptions are more dangerous for the workers."

"I was not aware this had passed."

"We need rule books."

"Perhaps a good idea taken to an absolutely ridiculous extreme."

"Fly-by-nights will have a bigger advantage."

"The ropes and belts will be as much a hazard; workers can trip or twist an ankle from stepping on each other's gear."

"Ludicrous, ridiculous - financially and logistically difficult."

"Leave the life lines and safety nets to the high wire performers in the circus."

One Wisconsin chapter reports that OSHA inspectors have been "camping out" at several remodeling sites waiting for a violation to occur. One employee removed his safety belt because it was causing him back pain, and the employer was cited within minutes.

Others claim that their insurers are not inclined to lower their workers' compensation rates, even with the new safety systems in place. This is interesting because workers' compensation is one place OSHA believed would be an area of savings for construction companies.

Another chapter representative has learned that a local supply house has refused to sell the fall restraint systems for fear of the potential liability.

Others complain that OSHA officers are unable to answer practical implementation questions and "what-if..." scenarios.

Generally, the membership is dissatisfied with the lack of information and resources provided by OSHA, the practicality of the rule, and its real effectiveness. We are left wondering whether all the effort is worth the trouble and expense and whether the desired results will even be achieved. It appears that the benefits do not outweigh the costs, confusion, and possibly dangerous consequences. In reality, the rule is probably creating more hazards than it is abating. If proper and accountable risk assessment, cost-benefit, and regulatory flexibility analysis had been conducted, subject to judicial review, we believe that this standard would have never been lowered from the previous 16 feet to the impractically low 6 feet.

We urge the Subcommittee to push the entire Congress to take a closer look at the feasibility and practicality of this new fall protection standard in either the context of a regulatory moratorium, a legislative review or veto, general regulatory or OSHA reform, or as an item for "Corrections Day." Regardless of the vehicle, something must be done.

Thank you Mr. Chairman, and your staff, for inviting me to outline some of the post-rulemaking problems members of the remodeling industry face in light of this new rule. We hope this hearing will draw greater attention to this particularly problematic regulation.

NARI is committed to enhancing the professionalism of the remodeling industry and serving as an ally to homeowners. For more information about NARI, contact Patti Burgio, director of government affairs, NARI, 4301 North Fairfax Drive, Suite 310, Arlington, VA 22203, 703/276-7600.

STATEMENT OF JOSEPH A. DEAR
ASSISTANT SECRETARY OF LABOR
FOR OCCUPATIONAL SAFETY AND HEALTH
BEFORE THE
SUBCOMMITTEE ON REGULATION AND PAPERWORK
COMMITTEE ON SMALL BUSINESS
U.S. HOUSE OF REPRESENTATIVES
JUNE 15, 1995

Mr. Chairman and Members of the Subcommittee:

Thank you for this opportunity to discuss the Occupational Safety and Health Administration's revised fall protection standard (Subpart M of 29 CFR Part 1926; Part 1910), particularly as it affects the residential construction industry. Before discussing the fall protection standard, I would like to make a few general comments.

In the past few months, we all have heard a lot of troubling stories about OSHA, almost all of it negative, and almost all of it not true. These include stories that OSHA is filled with incompetent inspectors who fine businesses thousands of dollars for nitpicky violations that have little to do with worker safety. You may have heard a number of "horror stories" which have been circulated about overzealous enforcement by OSHA. But most of these stories have little basis in fact. Nor does the impression they leave accurately reflect the successes of OSHA in preventing injuries and illnesses or the improvements the agency has made recently. Make no mistake, OSHA is changing the way it does business. As announced by President Clinton, Vice President Gore, the Secretary of Labor and myself on May 16, OSHA has begun regulatory reform initiatives to enhance safety, trim paperwork, and transform the agency. OSHA is working to carry

out the President's commitment. Copies of the President's Report on "The New OSHA" were mailed to each of you in May.

The New OSHA

First, OSHA is changing its fundamental operating model from one of command and control to one that provides employers a real choice between a partnership and a traditional enforcement relationship. This change is designed to separate good actors from bad actors in the safety and health arena, and to treat them differently.

For example, OSHA plans to nationalize the successful features of its "Maine 200" program. In this program, which was instituted in 1993, the 200 Maine companies with the highest number of injuries were offered a choice: work in partnership to improve safety, or face stepped-up enforcement. All but two firms chose partnership. The firms received assistance in developing safety and health programs, and in return were given the lowest priority for inspection (in other words, inspections generally occurred only if there were formal complaints or serious accidents).

The Maine program is extremely promising. In two years, the employers self-identified more than fourteen times as many hazards as would likely have been cited by OSHA inspectors. Nearly six out of ten employers in the program have already reduced their injury and illness rates, even as inspections and

fines have significantly diminished.

OSHA will expand the most successful features of this program nationwide. These successful elements include: using worksite-specific data to help identify high-hazard workplaces, offering employers a choice in how they work with OSHA, providing information to employers about effective safety and health programs, conducting efforts to find and fix hazards, ensuring management commitment and employee involvement, and modifying enforcement policies for high-performance employers.

Common Sense Regulation

Second, OSHA is changing its approach to regulations by eliminating or fixing out-of-date and confusing standards, identifying clear and sensible priorities for new rules, focusing on key building block rules, and emphasizing interaction with business and labor in the development of new rules. As part of its effort to implement common sense regulation, OSHA will rewrite many of its standards in plain language.

OSHA has already begun identifying outdated, duplicative or conflicting regulations, which can be particularly burdensome to small businesses. We held meetings with stakeholders in May and the early part of June to gather input on which OSHA regulations should be eliminated or revised.

Results, Not Red Tape

Third, OSHA is changing the way it works on a day-to-day basis, by focusing on the most serious hazards and the most dangerous workplaces and by insisting on results instead of red tape. OSHA inspectors no longer penalize employers who have not put up the required OSHA poster if the employer agrees to post it right away. OSHA inspectors have been told clearly that there are no numeric inspection goals and that their performance will be judged not by the number of citations and fines they issue, but by their success in finding and reducing hazards associated with injuries and illnesses.

Our recently implemented Focused Inspections in Construction policy allows OSHA to recognize the efforts of safety-conscious employers by conducting our inspections in a more streamlined manner, focusing on the four leading causes of construction fatalities: falls, struck-by, crushing and electrocution. As part of this policy, we will not issue penalties for "other-than-serious" infractions which are abated immediately.

I would be pleased to elaborate on these initiatives during the question and answer period.

Facts Supporting the Need to Issue a Revised Fall Protection Standard

OSHA's revised fall protection standard was issued on

August 9, 1994 and went into effect on February 6 of this year. The standard was developed with the participation and involvement of interested parties from both labor and industry, and is expected to save over \$200 million annually in wage and productivity losses, medical costs, administrative expenses, and other costs associated with accidents.

Falls are the leading cause of death and one of the leading causes of injuries to construction workers. According to the Census of Fatal Occupational Injuries, there were 273 fall fatalities in the construction industry in 1993, accounting for 30 percent of all construction fatalities. (In the roofing industry, two-thirds of all fatalities were caused by falls.) An OSHA study of fall fatalities that occurred between 1985-1989 found that eight percent were caused by falls of between six and ten feet.

OSHA's regulatory analysis conducted in support of the standard estimated that 115,000 injuries occur due to falls in construction each year, 68,000 of which would be addressed by the revised Subpart M. It also found that approximately \$718 million is spent each year on workers' compensation for lost workday fall injuries. Full compliance with the revised fall protection standard is expected to save 79 lives and prevent 56,400 injuries per year.

Data from the Bureau of Labor Statistics (BLS) shows that 60 percent of all lost workday fall injuries occurred at heights under ten feet. Forty-one percent of these injuries were to

construction workers. A separate BLS study on falls demonstrated that of 110 falls from roofs, half involved workers falling distances of 15 feet or less. Injuries from such falls can be very serious. The study found that over half of these workers suffered fractures to one or more parts of their bodies, over 40 percent suffered muscle sprains, strains or torn ligaments, and 9 percent suffered a concussion. Data like this led OSHA to conclude that falls of less than 16 feet (the fall distance permitted for low-slope roofing work by the fall protection standard as it was written at that time) pose a significant hazard and that workers exposed to such falls should be protected.

Preventable Tragedies

But let us move beyond the statistics. Let me tell you about some real people who were killed in falls of less than ten feet. On December 1, 1992, in Towanda, Pennsylvania, a 46 year-old roofing foreman was mopping hot tar on a roof so that another employee could apply four-by-four sheets of insulation. The foreman was situated near an unguarded edge of the roof, and was not wearing a safety belt and lanyard. As he pushed away the hot tar kettle and turned around to retrieve a piece of insulation, his right foot stepped off the edge. He fell 7 to 10 feet, bounced off horizontal pipes and onto a concrete ramp near ground elevation. A helicopter transported him to a hospital, where he

died the next day.

In California, on September 3, 1992, an inexperienced 34 year-old roofing contractor assigned to do ground work brought a hammer to a co-worker on a bare plywood roof. On the roof, his "street-type" shoes slipped out from under him. He slid down the roof and fell 9 feet to the pavement. He suffered a severe concussion and hematoma and died three days later.

On August 1, 1990, in Kaneohe, Hawaii, a 56 year-old employee climbed onto a roof where a re-roofing job was in progress. The employee managed to maneuver around one unbarricaded opening near a skylight; however, he tumbled through another opening which was covered only with tarpaper. The worker fell 9 feet to his death.

All of these incidents could have been prevented with simple, cost-effective precautions such as those required by the revised fall protection standard.

Complaints about the Rule

I understand that since the fall protection standard went into effect, some have expressed concern that the standard's requirements are too onerous. The principal criticisms concern the infeasibility of conventional fall protection methods in certain situations and the possibility of creating a greater hazard when using certain fall protection methods.

In drafting the revised standard, OSHA made every effort to

account for these issues, and to allow employers sufficient flexibility to deal with them. For example, the agency recognized that the certain sectors of the construction industry face unique challenges. Thus, we specifically stated in the rule that for precast, leading-edge and residential construction work, employers may use alternate methods of fall protection when the use of conventional methods would be infeasible or would create a greater hazard. All the employer has to do is develop and implement a fall protection plan that explains the particulars of the situation and the alternative measures being used. The employer would maintain the plan at the worksite and make it available to the compliance officer in the event of an OSHA inspection.

OSHA has met many times with the National Roofing Contractors Association (NRCA) to discuss contractors' concerns about greater hazards and feasibility, and NRCA has agreed to develop a draft fall protection plan to meet the needs of its industry. OSHA expects to receive the draft plan this month. If the agency finds that the plan would facilitate compliance, it may be published in the Federal Register as a non-mandatory appendix to the standard.

Another issue that has come to our attention is the concern of many small contractors that they will be placed at a competitive disadvantage against other contractors who are not complying with the rule and who may escape OSHA enforcement. What some contractors may not realize is that OSHA does not have

jurisdiction over sole proprietorships or other companies where no employer-employee relationship exists. Unfortunately, this may mean that there is not a level playing field between these different types of companies in the residential construction industry, so the concern is understandable. It is not, however, a valid reason to deny needed fall protection to millions of workers.

History of the Rulemaking

OSHA developed the revised fall protection standard, as it does all of its standards, through a rulemaking process that includes and involves the regulated community. OSHA is fully committed to this process, which is characterized by the following elements:

- 1) Creation of numerous opportunities for those who will be affected by a standard to express their views, provide information or statistics to back up their assertions, and learn OSHA's intentions. These opportunities take many forms, from public hearings, stakeholder meetings, and public comment periods, to electronic means such as the Internet.
- 2) Willingness to listen to the comments received and take them into account, making changes to the proposal based on input from the regulated community. OSHA always responds to comments submitted to the rulemaking docket in its published final rule, either indicating how the comment changed the proposal or

explaining why the agency has failed to adopt a suggested change.

3) Careful analysis to assure that affected employers and workers will find that the standard, as promulgated, is both reasonable and necessary.

4) Availability to solve problems on a case-by-case basis after the rule takes effect and readiness to issue interpretations to clarify the rule, if that becomes necessary. OSHA's Directorate of Compliance Programs in the national office issues compliance directives to provide guidance for field officers, and provides interpretations of rules in response to letters and phone calls from the public. OSHA's field offices also respond to questions about rules on a case-by-case basis.

OSHA met all of these criteria with respect to the revised fall protection standard.

In November of 1986, OSHA issued its proposal to revise Subpart M and require some fall protection measures when the fall distance is 6 feet or more. A comment period was open until August 1987; 162 comments were received. Public hearings were held in March 1988, and the rulemaking record was closed in August 1988. The record was reopened twice: once from August 1992 through November 1992, for the purpose of considering new information on precast concrete construction, and again from March 1993 through May 1993. The second reopening of the record was for the purpose of discussing the feasibility of protecting employees engaged in residential construction from fall hazards using conventional fall protection systems, and to request

information regarding alternative measures or safe work practices in the residential construction industry. Twenty-eight comments were received.

The appropriate level for the maximum fall distance was one of the significant issues during the rulemaking. Many roofing industry participants expressed the view that workers need not be protected from falling off sides and edges of low-slope roofs unless the fall distance exceeds 16 feet, the maximum allowed by the previous OSHA fall protection regulation. However, OSHA's Advisory Committee on Construction Safety and Health, which includes employer representatives, recommended that a maximum fall distance of 6 feet be set for both low-slope roofs and steep roofs. NIOSH - the Federal agency charged with conducting research on occupational safety and health - concurred with this finding. The United Union of Roofers, Waterproofers and Allied Workers (Roofers Union) also supported changing the maximum fall distance to 6 feet during the rulemaking.

However, in March 1994, the NRCA and the Roofers Union submitted a joint position paper to OSHA recommending that the provision addressing roof work on low-slope roofs not require fall protection until the worker was exposed to a fall of 10 feet or more. They did not recommend changing the 6-foot fall protection requirements for any other type of construction activity covered by the revised rule. The Agency gave serious consideration to the recommendation, but in light of the data showing that falls from heights of six to ten feet are a

significant cause of deaths and serious injuries, OSHA concluded that the 6-foot fall protection requirement was necessary to provide an appropriate level of safety for workers on low-slope roofs. Therefore, the final rule places the same 6-foot requirement on low-slope roofing activities as applies to the rest of the construction industry. I would like to clearly state, however, that employer concerns were not ignored. The standard allows for employer flexibility in methods of compliance, reflecting OSHA's recognition that there will be situations where conventional methods of providing fall protection would be infeasible or would create a greater hazard for employees. The standard also contains a non-mandatory appendix (developed in cooperation with the residential construction industry) that is intended to facilitate compliance with the rule.

The rulemaking record demonstrated that employees in all construction industries covered by the new standard face significant risks related to fall hazards. Let me emphasize that there were no legal challenges to OSHA's basic findings that the requirements of the revised fall protection standard a) are reasonably necessary to protect affected employees; b) are cost effective; and c) are not going to produce significant adverse economic impacts.

Outreach to Stakeholders

OSHA has made a concerted effort to meet with representatives of the regulated community, both during the development of the revised fall protection standard and since it was issued. During the period from June 1992 to August 9, 1994, when the rule was issued, OSHA held ten meetings with representatives of the residential construction industry to hear and address their concerns about feasibility and creating greater hazards. As a result of these meetings and in response to their comments, the final rule allows greater flexibility in this industry, as I discussed earlier. Since the final rule came out, OSHA has held an additional ten meetings with the residential construction industry to explain the rule and discuss "real world" concerns. OSHA has also reviewed and commented on two National Association of Home Builders' video tapes, and written materials for NAHB's outreach efforts on fall protection. We have published a pamphlet, available from any field office or from our Publications Office, explaining the requirements of the standard and answering common questions. And these are just the efforts of the National Office. OSHA's field offices have also held hundreds of meetings, and answered hundreds of phone calls and letters from representatives of the residential construction industry concerning fall protection. OSHA has made every effort to respond to the concerns of the regulated community and to involve all interested parties in the development and

implementation of this standard.

OSHA Is Willing to Address Compliance Concerns

I realize that some confusion may exist in the regulated community concerning certain aspects of the rule. The pamphlet that OSHA issued spells out very clearly which activities are covered by the rule and which are not, and should prove helpful to those who have questions.

Further, we expect that a forthcoming memorandum will offer clearer guidance to our field offices, which will, in turn, lead to greater consistency in the enforcement of this standard across the country.

Conclusion

OSHA is making positive changes in the way it operates, to protect the working men and women of this country more efficiently. The new OSHA is emphasizing common sense regulation and results instead of red tape. We believe our revised fall protection standard is a step in the right direction.

Mr. Chairman, I thank you for the opportunity to talk about the issues surrounding OSHA's revised fall protection standard. I will be pleased to respond to any questions.



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Statement Of

The Manufactured Housing Institute

by

Dan Gilligan

Before The

U.S. House of Representatives

**Committee on Small Business
Subcommittee on Regulation and Paperwork**

Hearing on OSHA Fall Protection Regulations

Mr. Chairman and members of the subcommittee, my name is Dan Gilligan and I am Vice President for the Federated States Division of the Manufactured Housing Institute. MHI is a national trade association that represents all segments of the manufactured housing industry. Our members are home manufacturers, retailer/contractors, community owners, suppliers, lenders and service companies. A significant portion of my work efforts at MHI are focused on those issues which effect our retailer/contractors who are mostly small business firms. These firms comprise the segment of the manufactured housing industry that is unfairly burdened by the OSHA regulations you are reviewing today.

The manufactured housing industry builds homes on assembly lines and ships them to model home centers or directly to designated home sites. The term manufactured home does not include all forms of factory built housing. Some factory built homes are what we call pre-cut or panelized homes and those homes can require substantial on-site labor. Manufactured homes are built to federal standards and are usually shipped in one or more complete sections. When these homes leave the factory they are substantially complete and do not require extensive construction at the home site.

Because manufactured homes do not require extensive construction at the home site, the OSHA requirements for fall protection are very impractical.

In 1994, the manufactured housing industry built and sold 303,932 homes in the U.S. Nearly half of those homes, 147,473, were multi-section homes which are delivered in two or more sections and require workers to join the roof. We estimate that the average multi-section

home requires two workers to work one to two hours on the roof completing the roof connections and ridge caps. You should also note that nearly all of our roofs have a low slope and fall related injuries are rare.

The aforementioned 303,932 homes were manufactured in 269 factories where most of the roofing materials were applied. These homes were sold and installed by more than 5,000 local small businesses operating as retailers and contractors. The new OSHA rule does not apply to the factory operations but it does apply to the 5,000 small business firms that finish the homes in the field. The new OSHA rule does provide contractors some options for fall protection but none of them are practical for our industry. Arranging a safety net or erecting guardrails at the home site will take more time than actually joining the roof. A personal fall arrest system will not work because there are no open structural or framing areas for anchoring the equipment. Since these three choices will not work, the only remaining choice is to prepare a "Fall Protection Plan."

If this regulation were in effect in 1994, our industry would have had to prepare 147,473 individual Fall Protection Plans. The sample plan prepared by the National Association of Homebuilders was ten pages in length. This would require more than one million pages of paperwork to be completed. It will take at least 1.5 manhours per home to write each plan. Each plan requires a site visit and the designation of Controlled Access Zones (CAZ). The CAZ must be staked off with signs and ropes which will add .5 manhours to the process.

When the home is delivered to the site, a crew supervisor must be designated to serve as a safety monitor. Now, not only do we have two workers on the roof connecting the sections, we must have a supervisor on the roof watching them work. The regulations are clear that this safety monitor cannot assist in the physical work efforts. This adds two additional manhours of cost to the home, to say nothing of the aggravation to the two persons who are actually working. The safety monitor is supposed to warn the workers if they get close to the edge of the roof.

If we add four manhours to each of the 147,932 homes sold last year, we are looking at a 591,728 manhour increase. We estimate the average manhour charges used by our retailers is \$28.00 per hour. The added cost to manufactured homes sold in 1994 would have been \$16,568,384.00.

Mr. Chairman, we believe that we have used some very conservative statistics in this analysis. The impact of this rule on our industry could easily exceed \$20 million annually because many of our single section homes, which we have excluded from this analysis, require workers to work above six foot. Also, we did not consider the cost of the training requirements imposed in the regulations. Our members have told us that fall related injuries are rare in our industry. Adding one million pages of paper work and \$20 million of cost to our customers cannot be justified.

As with all consumer purchases, the increased costs caused by regulations such as this are passed on to the customer. An important component of our industry success is affordability. Regulations such as these have a direct negative effect on affordability. We hope that you and other members of the subcommittee will ask OSHA to revise these regulations so that they are cost effective and practical.



STATEMENT BY
WILLIAM A. GOOD, CAE
OF THE
NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
BEFORE THE
SUBCOMMITTEE ON REGULATION AND PAPERWORK
COMMITTEE ON SMALL BUSINESS
U.S. HOUSE OF REPRESENTATIVES
CONCERNING THE
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S
NEW FALL PROTECTION STANDARD

JUNE 15, 1995

The National Roofing Contractors Association (NRCA) represents more than 3,500 members from all fifty states and 48 countries outside the U.S. NRCA members perform approximately 60 percent of all roofing work done in this country, and employ more than 100,000 workers. NRCA was formed in 1886, and is one of the oldest national trade associations in the construction industry.

NRCA members have been facing difficult times. The market for roofing work, while generally reliable, is subject to such economic forces as interest rates, office vacancy rates, and new housing starts. Roofing contractors are also vulnerable to the weather, and to a workforce that is more transient than most.

The average NRCA member, in fact, employs about 35 people during the peak of his/her season, and has annual sales of about \$3.4 million. Profit margins for roofing companies average only about three percent per year, as the marketplace is highly competitive, and there are few, if any, barriers to entry.

Yet roofing contractors are generally resilient, and find ways to operate successfully even in the face of these difficulties. And they rarely complain.

However, we have heard from our members with increasing frequency in the last few years, because they are simply unable to cope with the volume of federal regulations that they are required to understand and be in compliance with. These include complicated rules issued by the Occupational Safety and Health Administration (OSHA), by the Environmental Protection Agency (EPA), by the Department of Transportation (DOT), by the Department of Labor (DOL), and of course by the Internal Revenue Service (IRS). Most roofing contractors are hands-on managers, who do not have the luxury of hiring safety officers, or any other employees who can be used to help the company be in compliance.

As the regulations have increased, so have the frustration levels of our members, who must now be experts in asbestos regulations from two different agencies (OSHA and EPA), with the Federal Motor Carrier Safety Regulations (DOT), with EPA disposal rules and underground storage tank rules, and with federal procurement policy, just for starters.

As of February 6, 1995, they have also had to comply with a new OSHA fall protection standard, which has resulted in the loudest and longest outpouring of protest we have ever witnessed.

Our purpose in appearing before this subcommittee is not to debate the merits of the standard. Roofing is one of the most dangerous occupations in the country, and falls do account for too many injuries. Our association, in fact, has been actively promoting fall protection measures since long before this new regulation was promulgated.

Instead, we want to take the opportunity to discuss the sequence of events that led to the promulgation of this new rule, because it represents, in our view, all that is wrong with the rulemaking process today. The process took far too long, important evidence was either ignored or never considered, and economic consequences were given only a cursory examination. Furthermore, the economic impact analysis of the standard's effect on small business, as required under the Regulatory Flexibility Act, was routinely dismissed -- without justification and without any recourse for those small businesses affected.

We will discuss each of these problems separately. But even worse and more inexplicable is the fact that OSHA not only ignored some important evidence, they actually imposed a six foot height threshold that is more stringent than one that had been jointly recommended to them by both management and labor. We are having an ongoing dialogue with OSHA in that regard, and we are hopeful that some relief will be found for our members.

Let us first discuss some of the procedural issues.

THE PROCESS TOOK FAR TOO LONG...

The Notice for Proposed Rulemaking for the standard in question was issued in 1986, some eight years prior to the publication of the final rule last August. While we understand the dangers of a rulemaking that is too hasty, it is impossible to justify a process that takes eight years and has satisfied neither workers nor management.

OSHA has tremendous staying power and, in fact, many of the same people who were involved with the issue in 1986 are still involved. Because OSHA has no time requirements for issuing a final rule, it can choose to do so when it expects the least resistance, or when it knows the affected industry is least likely to object.

It happens that the Fall Protection Standard was issued in its final form at approximately the same time that a new, complex asbestos rule was issued by OSHA, and that asbestos rule occupied virtually all of NRCA's resources to litigate and settle.

We suggest, instead, that agencies be required to issue final rules within a reasonable time period from the issuance of proposed rules. If after a reasonable time period, the agency is unable to agree on a final rule, then it ought to be required to go back to the drawing board, re-open the rulemaking process, and enable commenters to demonstrate changes that have occurred in the marketplace since the time of the proposed rule.

From 1986 to 1994 changes took place in our industry that had a direct impact on fall protection. For example, a new standard on falls was developed by the American National

Standards Institute (ANSI) in that eight-year period, yet the OSHA docket was closed and it could not be included. Moreover, an agreement on fall protection was reached between NRCA and the United Union of Roofers, Waterproofers and Allied Workers, which again came after the closing of the docket.

During OSHA's eight year promulgation, there were other relevant industry changes that took place. The insurance market tightened, new roofing materials and equipment were introduced into the marketplace, and new worker training programs were introduced. But, simply because of their rulemaking process, OSHA was unable to properly consider any of these changes.

IMPORTANT EVIDENCE WAS IGNORED...

Everyone involved in the roofing industry understands that falls are a very real hazard. Contractors understand this, workers understand this, and of course OSHA understands this.

What we don't know, however, is very much about what conditions contribute to the falls, nor do we know very much about where or when they occur.

We know, for instance, that most falls involving roofing workers occur when the worker falls through an opening -- such as a deteriorated deck -- or off of a ladder. That little bit of evidence would suggest that OSHA should focus its efforts there, and not on the minority of falls, which occur from the roof edge.

We also know that fall regulations in place prior to 1986 were working; in fact, it appears that most falls occurred when existing regulations were not being followed, not because the regulations themselves were inadequate. This finding didn't deter OSHA, however, from simply making the rules more stringent -- and as we will see, adding significant cost and creating a greater hazard in many situations.

ECONOMIC CONSEQUENCES WERE GIVEN A CURSORY EXAMINATION...

OSHA, like all federal regulatory agencies, is required to conduct an economic impact analysis prior to issuing a rule. Here is what OSHA said about the economic impact of the new fall standard:

"The total estimated costs associated with new requirements included in the revised subpart M standard amount to about \$40 million annually. The majority of these costs (\$25 million) involve costs associated with providing increased fall protection for employees working on roofs."

Later, OSHA says:

"Compliance with the requirements of the revised subpart M standard has been determined to be economically feasible and is not expected to produce any significant adverse economic impacts."

Now, the most significant impact of the new standard is to require fall arrest systems for workers on homes that are more than six feet above the ground. In other words, it covers virtually all of the 100 million residences in this country. (The previous standard was triggered at a height of 16 feet, which excluded the majority of homes.)

When OSHA conducted its economic impact analysis, it had no way of knowing what the productivity cost would be to a contractor, because no studies have ever been done on roofing workers wearing safety belts and lanyards on relatively low-sloped roofs.

What we have learned since the imposition of the standard is that the cost increase for a typical residential roofing project is on the order of 10 to 15 percent. We have also learned that to properly outfit a roofing worker costs about \$500 -- and these are not one-time costs, because lanyards, for example, must be regularly inspected and replaced.

We have also learned that an employer who adheres to the standard is unable to pass these costs along to homeowners, because the vast majority of residential roofing contractors are simply choosing to ignore the new standard, since the likelihood of an OSHA inspection is remote.

So, using very conservative numbers:

A small roofing contractor, who does about \$2 million in annual sales, might have 20 roofing workers on the payroll. It will cost \$10,000 for the purchase of fall protection equipment that was generally not required before. Using only NRCA members, that's 2,700 firms times \$10,000 or \$27 million.

Then we must consider lost productivity. The evidence suggests that the \$2 million contractor is either going to have to absorb or pass through about \$200,000 per year in added labor, using the conservative figure of a 10 percent price increase. Though a \$2 million contractor is smaller than the average NRCA member, for the sake of illustration, even if our 2,700 members had to absorb just half of that -- or \$100,000 per year, that's \$270 million per year.

And then there are replacement costs for lost or broken equipment; added costs of sales (a contractor who charges 10 percent more than his competition must make more sales calls to get the same amount of business); costs associated with replacing workers who resign because they refuse to wear safety harnesses; and worker training costs.

Most roofing workers are paid hourly wages. A company that employs 20 roofing workers must train them during time that would otherwise be productive time. In other words, there is an opportunity cost for all mandated training. If those 20 workers earn \$10 per hour, which would be low, and the new training takes four hours per year, which is also a conservative estimate, then just the cost of training is \$800 for the company. So here we add yet another couple of million dollars to the overhead of our members.

It doesn't take long to understand that OSHA's cost estimates are absurdly low. Our point is not that OSHA deliberately underestimated the costs, but rather that they really had no way of knowing the costs because no one had attempted to use the fall systems that are now prescribed.

REGULATORY FLEXIBILITY ANALYSIS DISMISSED...

The Regulatory Flexibility Analyses that agencies, including OSHA, are required to perform when promulgating regulations are typically meaningless.

An agency is obligated to assess the impact of a new rule on small business entities, and here is what OSHA said about the new fall standard:

"Pursuant to the Regulatory Flexibility Act, OSHA has made an assessment of the impact of the revised standard and has concluded that it will not have a significant impact upon a substantial number of small entities."

That should be familiar language to the subcommittee, because it appears in the preambles to virtually all new regulations. It is rubber-stamp language, and we challenge OSHA to produce any documentation of the review that it conducted. There is none, and there could not be any, because any cursory examination of the impact of this standard on small business could not possibly conclude that it would not have a significant impact.

The reason this has become rubber-stamp language, of course, is that there is no recourse for any affected party that might want to challenge the agency's finding. The Regulatory Flexibility Act disallows judicial review of an agency's finding, and NRCA strongly supports legislative remedies for this shortcoming.

LABOR-MANAGEMENT AGREEMENT...

All of these issues, we feel, make a good case that the rulemaking process desperately needs to be fixed. But we must add to that one more element, which only makes the final rule even more inexplicable.

NRCA and the United Union of Roofers, Waterproofers and Allied Workers maintain a very strong and friendly relationship. We have, in fact, an ongoing joint safety and health committee, and we have worked together to develop training materials that are not mandated by any federal regulation. During the course of these meetings, and well before the issuance of the final fall standard, we jointly agreed that a height trigger of 10 feet would be appropriate for a number of reasons we felt were better understood by industry than by OSHA. This joint recommendation was quite simply ignored, leaving us to wonder who in OSHA believes they know our industry better than those who work in it every day.

THE REAL IMPACT...

What we have with the OSHA fall standard is the rulemaking process gone berserk. The rule took eight years to finalize; its cost estimates are understated by at least a factor of ten; no good data exist to support the rule; and the joint position of labor and management was ignored.

So today we have a rule that is, not surprisingly, wreaking havoc on our industry. A CNN News reporter, investigating the standard's impact in the Dallas area, concluded that about one in twelve contractors was even attempting to comply with it. We believe that's probably a high number.

The real impact of the standard is to punish contractors who want to make a good faith effort to comply with the law. If they do attempt to comply, they are likely to have workers quit, their costs increase, and their productivity decrease to the point where they cannot compete with non-complying contractors. OSHA understands that its enforcement in the residential contracting marketplace is at best sketchy, and there is no probability of citation for a job that can be completed in a single day, as many residential roofing projects can.

The fact that OSHA failed to take any of this into account in the eight years they worked on this rule suggests that the rulemaking process needs to be revisited. Real cost-benefit analysis must be utilized, and must include participation from affected parties. Real risk assessment must be required and must consider the greater hazards that are introduced when, for example, workers

have to walk over and around ropes on relatively low-slope roofs, or drag them through hot tar to get a job finished.

And a real analysis of the economic impact on small businesses, pursuant to the Regulatory Flexibility Act, must be provided for, with judicial review allowed for injured parties.

REMEDIES ARE POSSIBLE...

We are pleased to report that OSHA is not ignoring the outcry from roofing contractors on this issue. NRCA officials have had a series of meetings with OSHA officials to try to find some relief for contractors who operate in the residential marketplace, and it appears that some short-term solutions are possible.

But these remedies are occurring only after the fact, and only as a result of enormous protest combined with a changed political environment.

We believe that the process needs overhauling, and we appreciate the opportunity to offer our views.



OPENING STATEMENT BY
DOUGLAS JONES
OF THE
NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
BEFORE THE
SUBCOMMITTEE ON REGULATION AND PAPERWORK
COMMITTEE ON SMALL BUSINESS
U.S. HOUSE OF REPRESENTATIVES
CONCERNING THE
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S
NEW FALL PROTECTION STANDARD

JUNE 15, 1995

Chairman Talent and Members of the Subcommittee, my name is Douglas Jones. I am Vice President and Chief Operating Officer of South Side Roofing Co., Inc. Our firm performs both flat and steep work on residential, educational, commercial, and industrial buildings in the greater St. Louis Metropolitan area. During the past year, our company performed work on approximately 550 roofing projects.

Mr. Chairman, I am here to testify about the burdens imposed on contractors by OSHA's regulations, and in particular OSHA's new Fall Protection Standard. Please don't misunderstand the intent of my remarks. I believe that there is a place for OSHA in our industry. The creation of OSHA was well-intentioned. However, bureaucracy has transformed OSHA into a liability rather than an agency that could be helpful to legitimate roofing contractors.

For example, up until approximately six years ago, I spent a considerable amount of my time estimating work. I was quite successful -- bringing in anywhere from a quarter to a third of our annual sales volume. However, over the past six years my ability to estimate work has been severely limited to the point that I now have no time to estimate any work at all. This is due entirely to the necessity that I keep current with the increasing number of government regulations, particularly those of OSHA.

Since I am no longer able to estimate work, our firm has been forced to hire another estimator to generate the sales. The cost of this estimator, including salary, benefits, payroll taxes, and insurance, is \$60,000 annually. And during this past year, we have incurred \$35,000 in additional expenses, related solely to OSHA. (This money was spent for safety equipment, safety awards, and safety training). These two costs total \$95,000, which represents 11 percent of our overhead expenses.

One cost that is not included in the above figures, and one that we foresee as a strong possibility, is increased workers' compensation claims resulting from adherence to the OSHA Fall Protection Standard. Some of our employees are complaining of back strain associated with wearing full body harnesses and others are complaining of tripping over the lines laying on the roof to which the harnesses are attached. But for the Fall Protection Standard, we would not be experiencing incidents of this nature.

How do we recover these additional costs? We include them in our proposal and try to pass them on to you and the public. But, our roofing prices are 11 percent higher than they would be if we weren't obligated to conform to the multitude of OSHA regulations and the public is reluctant to pay these higher prices. In one instance, a customer of our firm questioned our price for re-roofing his home. When I responded that we had to factor an additional 11 percent into our bid, he commended our dedication to safety, but replied that since this additional cost did not give him any more quality, he wasn't interested in paying it. We lost the job and our men lost the wages they would have earned had they performed the work.

This was particularly disconcerting because I knew my competitor, who won the bid, would not conform to OSHA regulations. This was, and is, not an isolated incident. Time and time again, I see work being performed by contractors who are making no attempt to conform to OSHA regulations. They realize that the chances of being inspected and cited are small, so they are willing to ignore the regulations.

One example of the extent to which contractors flagrantly disregard the OSHA standards was apparent to me during my visit to Washington this past April. While walking past the outside steps leading up to the House Chambers, I noticed workers in the process of removing and replacing the steps. I counted four violations of the OSHA standards:

1. ladder did not extend three feet above the landing;
2. workers were engaged in work on levels not protected by guardrails;
3. workers were standing on top of guardrails while performing work; and
4. workers, while not wearing hard hats, were directly below the area in which others were working.

In the private sector, conscientious contractors and their personnel are losing work because the public generally does not want to pay the costs associated with conforming to the regulations. Non-conforming contractors are gaining work because of the advantage realized by not factoring in these costs.

Furthermore, our employees strongly object to our policy requiring them to wear the full body harnesses mandated by the Fall Protection Standard. They believe that the clutter created when the safety lines are spread across the roof is more of a threat to their safety than the height at which they are working -- especially when they are working at heights of less than 16 feet. Also, they ridicule the OSHA requirement that a hole 2" x 2" either be covered or be guarded by guardrails. The people whom the regulations are intended to protect have no respect for the regulations because they believe them to be hazardous and impractical.

Mr. Chairman, I firmly believe that OSHA's Fall Protection Standard must be reviewed and modified to emphasize practical guidelines and to eliminate impractical requirements that are ignored by many, ridiculed by the average worker, and not enforced. Until that occurs, your active involvement to help us remedy this situation is appreciated.

Thank you for your attention. If you have any questions, I will be happy to answer them.



OPENING STATEMENT BY
REID RIBBLE
OF THE
NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
BEFORE THE
SUBCOMMITTEE ON REGULATION AND PAPERWORK
COMMITTEE ON SMALL BUSINESS
U.S. HOUSE OF REPRESENTATIVES

CONCERNING THE
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S
NEW FALL PROTECTION STANDARD

JUNE 15, 1995

Chairman Talent and Members of the Subcommittee, my name is Reid Ribble. I am the President of The Ribble Group Inc. which operates two small roofing companies in North Central Wisconsin. Our companies complete approximately 250 roofing projects each year.

I am here to testify about my concerns with the new OSHA Fall Protection Standard. This past February OSHA issued a new safety standard that is intended to reduce injuries that result from falls. I support that goal. As a second generation roofing contractor, I am fully aware of the risks involved in my trade. However, falls are not a common occurrence. In the last ten years my company has only experienced one lost time accident from a fall. This occurred in the spring of 1994, when an employee fell from a ladder. His fall was caused by his violations of our safety policies and training. The new regulations would not have protected him.

My company takes safety seriously. Although not required by any agency, we have taken it upon ourselves to conduct mandatory, weekly safety meetings for all field personnel. In addition to providing extensive training in safety and safety awareness, my company provides safety equipment in excess of what is called for in all situations.

Mr. Chairman, I do not feel that my company is unusual in this regard. Small businesses are dependent upon their employees. Even one injured person can have a significant impact on the entire operation. I know each of my employees personally. Their health and safety is my personal concern.

The new OSHA Fall Protection Standard, though well intended, has had a dramatically negative effect on my company's performance and safety. Already this year, we have had two accidents (resulting in injuries to elbow and knee joints) because employees have tripped on the ropes designed to protect them.

We have also experienced a significant cost increase. So far, we have invested \$410 per employee for the harness, lines and lanyards. We must also purchase attachment anchors that can cost anywhere from \$65 per project to as much as \$300 per project, depending on the type of roof. Even more disturbing is that my company is experiencing a production loss. Compared to the first quarter of 1994, my company is now installing 27 percent fewer square feet of roofing--even though I have the same number of employees. What does this mean for the homeowner? Well, I estimate that the additional cost to the typical Wisconsin homeowner reroofing his or her home is \$300. Mr. Chairman, this regulation is an unfair burden on my company and on American consumers.

Let me give you one more example about how this regulation is effecting my company. In 1993, our "close-ratio" (the ratio of jobs sold verses jobs estimated) was 1.9 out of 10. In 1994, the number was 2.2 out of 10. So far in 1995 our close-ratio is 0.6 out of ten. This dramatic decline in my company's sales is, in my opinion, directly related to the "pass through"

of costs associated with our compliance to the new standard. This lost business is going to roofing contractors who offer little or no protection to their employees and who flaunt the law with impunity.

Those contractors operate in this manner because OSHA is unable to adequately enforce this standard. Typical roofing projects are of short duration. They last from one to three days. Most roofing projects will be completed without a visit from OSHA. My competition knows this and for the most part chooses to take its chances. They have been rewarded and I have been victimized by my sincere attempt at compliance. This causes me great concern and should cause you concern as well. Nothing is gained when safe, professional roofing contractors are losing jobs. Companies like mine should be applauded for their safety records and encouraged to do even better, but the new OSHA fall protection standard has had the opposite effect. It has insulted my employees, who for years have taken pride not only in their workmanship but in their ability to complete their work in a safe fashion. Mr. Chairman and members of the subcommittee, I implore you to help us find remedies.

I appreciate this opportunity to address the subcommittee today and I would be happy to answer any questions.

STATEMENT OF
THE NATIONAL ASSOCIATION OF HOME BUILDERS
BEFORE THE
SUBCOMMITTEE ON REGULATION AND PAPERWORK
OF THE
COMMITTEE ON SMALL BUSINESS
U.S. HOUSE OF REPRESENTATIVES
ON
THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S (OSHA)
FALL PROTECTION REGULATION

Mr. Chairman, Ms. Velazquez, and Members of the Subcommittee:

Thank you for the opportunity to appear this morning to comment on the current Occupational Safety and Health Administration's (OSHA) Fall Protection Standard. My name is Howard Saslow and I am the Production Manager for Hallmark Builders, a firm located in Columbia, Maryland, which specializes in the construction of single-family homes. I appear before you today in my capacity as a member of the National Association of Home Builders' (NAHB) OSHA Reform Working Group, Fall Protection Working Group and Construction Safety and Health Committee.

BACKGROUND

Before I begin, Mr. Chairman, let me state clearly that NAHB and its member firms are deeply committed to jobsite safety. Indeed, I feel that our industry's national efforts have had a significant impact on the level of overall safety knowledge and awareness on residential jobsites.

In fact, NAHB was the first organization to develop a complete set of fall protection compliance materials for the construction industry on the new regulation. I mention this because NAHB policy does not support the complete elimination of the fall protection standards. NAHB's members do, however, believe that significant modifications must be made to the existing requirements.

For many years, residential builders were not often subject to OSHA inspections, in part due to the agency's misunderstanding of home building and its related crafts. Around 1990, OSHA began to place a much greater enforcement emphasis on the residential sector. As a result, many home builders found themselves subjected -- for the first time -- to OSHA standards which had been developed for heavy commercial construction rather than single family homes.

Many mistakenly envision the typical home builder as a "high-volume" constructor, someone with the perceived ability to spread production and regulatory costs across many projects. In contrast, the majority of NAHB member firms are truly small businesses, primarily engaged in home-remodeling and the construction of single family homes. Indeed, over half of our members build fewer than 10 homes per year and close to 75 percent of our members build 25 or fewer homes.

These smaller builders were shaken by the complexity and breadth of the requirements being imposed upon them. Because there had not been much emphasis placed on the housing industry's previous compliance level by OSHA, many builders received substantial fines far out of proportion to the size of their business operations.

One of the concerns immediately voiced by many builders was an inability to reasonably comply with the pre-February 1995 fall protection regulation. In the past, the fall protection requirements builders were often cited for were found within a separate OSHA standard concerning scaffolding.

As early as 1993, NAHB began working actively with OSHA to provide information concerning the home building process and the industry's specific fall protection concerns. With the re-opening of the rulemaking process on the new fall protection standards, NAHB members began to develop specific recommendations for OSHA to consider when drafting the final regulation.

One of the most important issues raised by NAHB was the infeasibility of using conventional fall protection systems during many home building activities. In many stages of the house framing or carpentry process, a worker cannot use nets, guardrails or personal fall arrest systems to protect against a fall. In most of these situations, there is simply no adequate anchor point to support the weight of an employee's fall.

After many meetings with OSHA, one of which took place on my jobsite, NAHB began to impress upon the agency that home building is indeed different than commercial and industrial construction. Consequently, the fall protection standard is the first regulation in OSHA history to recognize residential construction as distinct and different.

Although the strides made by the agency to recognize and understand home building are appreciated, the fall protection requirements still place a tremendous compliance burden on the average builder. Simply stated, compliance with an OSHA construction standard does not come cheaply. Due to the transient nature of residential construction, safety training and equipment

purchases may often be repeated throughout the year. I can assure you that these types of expenses are not considered by OSHA regulators during enforcement actions. Moreover, strict compliance with the revised rule can still pose even greater hazards than those created by non-compliance. Furthermore, the revised rule also contains unnecessary costs in the form of increased, repetitive paperwork.

COST IMPACT

In order to purchase a basic personal fall arrest system that will adequately restrain a worker, a builder must spend approximately \$350 per employee for the restraint device alone. For the more sophisticated retractable lanyard systems needed for tile roofing construction, the costs are even greater -- upwards of \$1000 per employee. These estimates are exclusive of other hard and soft costs associated with the regulation's requirements, i.e. an anchor point device, the training required for proper use of fall protection equipment, and the inevitable production "slow-down" needed for workers to use the equipment.

The effect of current fall protection compliance can literally mean the difference between profit and loss. For example, a small roofing contractor in Florida with six workers who installs tile roofs would have to invest approximately \$6000 in fall restraint systems -- even though his work is primarily on a single story roofs with angles of only 19 degrees.

A 5:12 feet pitch roof system -- that is, a roof constructed at a 22 degree angle -- is not at all difficult to walk on and historically has generated a very limited range of fall protection concerns. However, according to the new fall protection requirements, workers would have to be anchored to the roof to prevent a fall.

The large investment in fall equipment needed to ensure OSHA compliance may be long term, but the "up front" cost is quite onerous for the small builder. The outlay required is an enormous financial burden for a small company, and even though the investment can, in some instances, be amortized and reused over the course of several roofing projects, that does little to diminish the initial financial impact.

Because of the enormous changes the current regulation requires the average builder to make, the standard simply cannot stand up to a reasonable cost/benefit analysis. Numerous sections of the regulation must be modified to accomplish the dual purpose of providing adequate worker protections, while allowing small builders to remain competitive.

FALL PROTECTION PLAN/PAPERWORK BURDEN

Throughout the final drafting of the fall protection rule, OSHA identified a prescriptive process (ultimately detailed in the regulation's non-mandatory appendix) as the only way that a contractor could adequately protect his/her workers while using "alternative fall protection systems." NAHB was actively involved in the development of these alternative systems, e.g. sufficient worker training to properly stage and construct an exterior wall near a potential fall hazard.

NAHB continues to stand behind the methods outlined in the appendix as a basic system to reduce the number of falls during the house framing and carpentry process. However, NAHB strongly opposes the enormous paperwork burden required by OSHA for these safe work practices to be utilized.

To use an alternative to a conventional fall protection system, an employer must -- in every instance -- develop a site-specific fall protection plan. This plan must be written by a "qualified person" and administered by a "competent person" who is on site during the activities that are covered by the plan. The plan must detail in writing exactly why conventional fall protection systems cannot be used during construction activities. This justification must also explain why other types of protective systems -- like scaffolds or mechanized equipment -- cannot be used.

While OSHA's intent may have been to ensure that each employer using alternative practices has done everything possible to protect his/her workers, the agency has instead imposed another unnecessary paperwork burden on small business. Site specificity is not needed to protect the lives of construction workers. If a company has implemented meaningful safe work practices, then its workers will not be in danger and the accuracy of a street address or the date listed on a jobsite plan is irrelevant.

For a builder to be concerned that the reassignment of a worker to a different jobsite may mean that he or she could be looking at the "wrong" fall protection plan during an OSHA inspection is also ridiculous. OSHA could reduce this paperwork burden by simply requiring that there be one Fall Protection Plan per company, with identical work practices required regardless of the worksite. If safety is not compromised, then all this matter really boils down to is a question of paper.

OSHA should also accept obvious justifications of infeasibility -- or the creation of even greater hazards -- due to the use of conventional fall protection systems. Right now, the only way a builder can use a safe work practice option is to laboriously detail the information within a site-specific plan. The agency should instead uniformly recognize circumstances when alternative methods are acceptable. This would allow OSHA to reduce an unnecessary paperwork burden, leverage its educational efforts on fall protection throughout the residential sector, and target the use of its limited enforcement resources at the abatement of actual hazards -- rather than on the writing of recordkeeping citations.

THE SIX-FOOT HEIGHT THRESHOLD

As the Members of this Subcommittee well know, a comprehensive regulatory action often involves an oversight of the obvious. This is certainly the case with the current requirement for employers to provide fall protection for workers exposed to fall hazards of six feet or more. When finalizing this element of the standard, OSHA officials seem to have been thinking solely of the potential hazards for workers falling into trenches and excavations -- or from elevations -- on commercial or industrial construction sites.

Probably the major issue of concern for home builders and contractors is the height at which the new fall protection standards take effect. The pre-February 1995 standards took effect if employees were working at heights greater than sixteen feet "ground-to-eave." Under certain OSHA "state-plan" requirements (such as California's), the threshold was twenty feet. The new six foot requirement is probably the most onerous aspect of the new standard, since almost all elevated work in home building is above six feet and therefore requires employers to comply with the complicated guidelines and the costs associated with them.

As it stands now, if an excavation is six-and-a-half feet deep, conventional fall protection systems must be utilized. Essentially, a builder must install guardrails around any trench to keep workers from falling into that trench. This is not an unreasonable requirement if a trench is twenty feet deep -- a dimension which carries some history of worker injury and potential hazard.

Although I have never heard of any serious injuries resulting from a worker falling into a house foundation trench, a builder must nonetheless still provide some means of fall protection if that trench is only slightly greater than six feet deep. To be sure, the installation and anchoring of a guardrail system that runs the entire perimeter of a house is very costly.

A similar problem exists for foundation construction. If a foundation or basement wall is eight feet high, then fall protection must be provided. This makes the construction activity during foundation concrete "pours" quite difficult, because the forms used during the pouring of a basement wall are not usually stable enough to attach heavy scaffolding.

In most cases, the preferred method of ensuring pour quality is to have workers stand on the top of the foundation form walls. This allows the worker to freely move around the work area. The worker's tasks require much more effort if he/she is forced to be on a lower, more inconvenient work surface. There is no sound reason to believe that requiring fall protection for this work practice improves worker safety. And, there is little indication that this is the type of hazard the agency was trying to control when they published the regulation.

The six foot requirement is also very burdensome during floor decking procedures, exterior wall erections and other housing-specific construction activities. If OSHA raised the height requirement to 10 feet for non-roofing activities, it would provide enormous cost relief to the industry -- while maintaining more than adequate protections for workers.

As mentioned, the six foot threshold requires employees working near basement trenches to be protected by guardrails, roofers on single-story homes to be in full-body harnesses, and foundation employers to install unnecessary guardrails even though no accident data in residential construction has been produced to support such requirements at these heights. As such, NAHB supports an eighteen foot "ground-to-eave" threshold, which is more stringent than some states, but a level that we believe would provide protection to the vast amount of workers involved in home building and substantially reduce the compliance costs on employers.

LOW SLOPE ROOFS

The standard's current definition of a low slope roof is another major concern to the housing industry. OSHA's current definition of low slope roofs requires personal fall arrest systems for a roof pitch greater than 4:12 (or a 19 degree angle). Yet many single story houses throughout the country have a roof pitch greater than 4:12. A single story home with a roof pitch of 6:12 -- which is only a 26 degree angle -- should not have to have a personal fall arrest system to protect workers -- yet the new regulation requires it. Think of a 45 degree angle. Most people would agree that you can safely stand on that. Now consider that the angle of a 6:12 pitch is but half of that. It is more than likely that a worker can safely move around on that surface. When OSHA wrote this standard, I cannot believe that this was the circumstance they envisioned as the major cause of construction fall injuries.

When workers are completing the roofing tasks, they often need mobility and range to do their job. Having workers "tie off" to an anchor point when there is little hazard is an unreasonable requirement for the small builder. Again, the housing industry is being regulated with the same rules that were designed for high-rise buildings. NAHB therefore believes that OSHA should raise its height definition of low slope to at least 6:12 -- or provide some other alternative that protects employees without unreasonably burdening small business.

CONCLUSION

In sum, the requirements for the use of the fall protection plan when conventional systems are not feasible -- or cause an even greater hazard -- must be revisited by OSHA. The requirements for the use of conventional fall protection systems must also be carefully reviewed to ensure that the significant financial impact on small builders does not outweigh the perceived safety benefits.

Let me reiterate, Mr. Chairman, that NAHB does not support the complete elimination of fall protection requirements. NAHB does, however, believe that OSHA should make the following modifications to the current rule:

- elimination of the need for a site-specific Fall Protection Plan;
- transferring the burden of proof for infeasibility and greater hazard to OSHA;
- raising the height definition of a low slope roof to at least 6:12;
- raising the "ground-to-eave" height requirement for personal fall arrest systems from six feet to eighteen feet; and,
- raising the height requirement for non-roofing activities (i.e. floor and wall openings) from six feet to ten feet.

Should the agency continue to choose not to accept these common-sense recommendations, then NAHB would ask the Congress to require OSHA to do so statutorily as part of the OSHA reform package slated for full House consideration sometime later this year.

That concludes my statement, Mr. Chairman. At this point, I would be happy to answer any questions which you or the other Members of the Subcommittee may have.



OPENING STATEMENT BY
ROBERT W. THERRIEN JR.
OF THE
NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
BEFORE THE
SUBCOMMITTEE ON REGULATION AND PAPERWORK
COMMITTEE ON SMALL BUSINESS
U.S. HOUSE OF REPRESENTATIVES
CONCERNING THE
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION'S
NEW FALL PROTECTION STANDARD

JUNE 15, 1995

Chairman Talent and Members of the Subcommittee, my name is Robert Therrien Jr. I am Vice President of the Al Melanson Company, Inc. We are roofing, environmental and acoustical contractors as well as metal fabricators from Keene, New Hampshire. We also have four affiliate offices in New Hampshire and Vermont.

Mr. Chairman, I am here this morning to briefly talk about our experiences with OSHA's Fall Protection Standard. The new standard requires that fall protection devices be used whenever an employee is working at a height greater than six feet. It has changed equipment requirements, forcing us to purchase full body safety harnesses (in lieu of the belts we already owned), shock absorbing lanyards, and additional staging and wall brackets.

In order to illustrate the problem from a personal perspective, I would like to run through three separate OSHA inspections that occurred on April 20, 21, and 26, 1995 at one of my company jobs. This project was a multi-building retirement community that is being built in Peterborough, NH. During the first two visits, the OSHA official inspected our roofers in conjunction with visits to several other trades on the job site. After reviewing our safety equipment, particularly fall protection, and verbally questioning our employees, he found no problems and issued no citation. At this point, we began to feel that the money spent on all the fall protection equipment might be worth the expense, aggravation and burden. However, we soon learned that this was not the case.

Believe it or not, within a one week period, the same OSHA inspector returned for a third visit to the job site. While driving his car to the job site, the inspector videotaped men on one of the roofs. But the distance from which he was filming was so far away, that when our safety director went to view the video it was noted that neither he nor the OSHA official could tell who the men were. Mr. Chairman, at this point, I would like to pose two questions: First, if you can't identify the employees from that distance, why film them? Secondly, who is more unsafe in this situation -- the men who are on an easily walkable (six in twelve) work surface or the OSHA official driving down the road videotaping out the side window of his car? (By the way, we believe the men that the inspector videotaped were not employees of our company.)

When the OSHA inspector arrived on the job site for a closer look, he cited us for two violations of the Fall Protection Standard. We were cited \$500 for the improper installation procedure of the anchoring brackets used for tying off. According to the inspector, our worker installing the fall protection brackets was not tied off. Let me explain that implementing the work practice the OSHA official demanded would require a roofer to use two lifelines while installing the brackets: after installing the first bracket, one line would be tied off; then after the second bracket was installed, the worker would tie off, walk back to the first bracket, untie, walk back past the bracket he had just installed, install a third bracket, tie off, walk back to the second bracket, untie, walk back past the third bracket, etc. This is a cumbersome, tiring and redundant work pattern on a shallow slope that is unacceptable to my employees.

In addition, our foreman was questioned by the OSHA inspector about our methods of roofing the back side of another building and what types of fall protection devices were utilized. The foreman explained that we had used pipe staging on that building as a fall protection system. The inspector then asked how we got onto the staging and my men stated that we had set a ladder up to the flat roof below this area, walked across a portion of the flat roof to the staging, and then up the staging to the roof. Upon inspecting the flat roof area, the inspector discovered unsecured roof opening covers on portions of the roof. Please note that we had completed our work on this building, but because there were unsecured holes on this roof installed by another contractor, we were cited and fined \$900.

Mr. Chairman, a safe work site has always been a priority for my company. In fact, the project's general contractor has used, and is still using, our company as a model for safety procedures and has asked other contractors to follow our policies. Yet we were still cited and fined excessively by OSHA, when other contractors on the same site were not. For example, it is my understanding that a small framing contractor was installing plywood decking in an area on another roof where an OSHA inspector was evaluating compliance. These men were carrying sheets of plywood around without any fall protection equipment at all. Their citation was only \$150. Does this type of inspection and selective citation policy improve fall protection safety on the work site? In my opinion, the answer is a categorical no -- it only further demoralizes my crew who feel that they have done nothing wrong.

I applaud the subcommittee's decision to hold a hearing on this timely issue, and I would be happy to answer any questions.

U.S. Department of Labor

Assistant Secretary for
Occupational Safety and Health
Washington, D.C. 20210

The Honorable James Talent
Chairman
Small Business Subcommittee on Regulation and Paperwork
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

Thank you for giving me the opportunity to testify before your subcommittee on June 15 to answer questions about the Occupational Safety and Health Administration's (OSHA) Revised Fall Protection Standard. During the hearing, you and other members of the committee raised several issues to which I would like to respond for the record. I hope that the information following will satisfactorily address your concerns about provisions of the Standard.

1. *Did OSHA propose to lower the threshold for protection from 16 feet to 6 feet for certain types of roofing work, prior to issuing a final rule implementing such a change?*

Yes. Despite comments by subcommittee members to the contrary, OSHA did include this change in its 1986 proposed rule. Attached is a copy of the notice of proposed rulemaking which, on page 42738, shows that OSHA did propose requirements that workers on steep roofs be protected from falls of 6 feet or more (proposed §1926.501(c)) and workers on low-slope roofs engaged in built-up roofing activities be protected from a fall of 16 feet or more. OSHA raised a specific issue (Issue #11, page 42730) about the low-slope roofing provision, stating the agency's belief that the threshold should be 6 feet, consistent with other provisions in Subpart M. (Note: Most residential roofing involves steep roofs).

During the public comment period, the agency received only four comments on the steep roof provision from the State of California, NIOSH and two roofing contractors. For the low-slope roofing provision, OSHA received 73 comments, mostly from roofing contractors. Most of the commenters supported the position of the National Roofing Contractors Association (NRCA) favoring a 16 foot threshold and allowing warning line and safety monitoring systems as an option for providing fall protection, based on the belief that few workers were injured in falls. However, the Roofers Union supported the 6 foot threshold, citing BLS data showing numerous injuries and deaths from falls below 15 feet. NIOSH and OSHA's Advisory Committee on Construction Safety and Health recommended that the provision be set at 6 feet for both steep and low-slope roofing work. Commenters also recommended that the definition of built-up roofing work be changed so that the same provision would cover all types of roofing work performed on low-slope roofs.

As a result, the final rule required fall protection for all workers working at a height of 6 feet or greater, but allowed widespread flexibility to the employer to choose how to provide that protection. The warning line and safety monitoring systems remained as options for low-slope roofing work and the definition of built-up roofing was changed so that the same provision applied regardless of the specific type of roofing work being done.

2. *Congresswoman Kelly asked Assistant Secretary Dear if he knew whether the pay scale for the roofer exceeded that of the average construction worker.*

According to BLS data (Employment and Earnings, 1994), the average hourly pay for all of construction is \$14.45, while the average hourly pay for employees working for establishments doing roofing, siding, and sheet metal work (these are usually lumped together for purposes of classifying types of construction employers) is \$13.10. BLS also reports that the median weekly earnings for construction trades is \$495; the median for roofers is reported as \$338, one of the lowest among those included in construction trades.

3. *Congressman Peterson asked whether OSHA had a matrix showing the costs and benefits of having a trigger height set at 6 feet, 8 feet, 10 feet, 12 feet, 14 feet, and 16 feet.*

As shown in OSHA's regulatory impact analysis for the revised Subpart M fall protection standard for construction, the effects of the changes to the current standard (including changing the trigger height for fall protection during roofing work from 16 feet to 6 feet) would involve costs of about \$40 million annually, would prevent over 15,000 injuries and 22 fatalities annually, and would result in direct savings of over \$200 million annually. Most of these costs and benefits are associated with roofing work, since the major changes to the standard address these activities. OSHA did not prepare a formal cost-benefit analysis for various trigger heights. However, a four year study of OSHA investigations in the construction industry showed that 1% of fatalities from falls occurred at heights below six feet, 8% at heights between 6 and 10 feet, and 25% at heights between 11 and 20 feet. Similarly, a 1984 BLS study showed that 60% of all lost workday fall injuries occurred at heights under 10 feet (includes both general industry and construction).

4. *Congressman Bentsen asked Assistant Secretary Dear to provide estimates of the percentage of the roofing industry that are sole proprietors and the percentage of commercial vs. residential construction companies covered by the rule.*

The Bureau of the Census estimates that the total number of roofing establishments is about 60,000; the total value of roofing work annually is estimated at \$10.5 billion. About 20,000 roofing establishments have employees and perform about 85 percent of the total estimated dollar value of roofing business. About 40,000 roofing establishments do not have employees and perform about 15 percent (\$1.5 billion) of the total dollar value of roofing work.

Although some roofing companies may specialize in either residential or commercial roofing, most engage in both types of roofing work. Roofing companies would be more likely to specialize in specific types of roofs, such as tile, asphalt, or shingle. Roughly half of all roofing work involves residential buildings.

5. *Chairman Talent asked OSHA to provide data regarding the number of fall deaths in the manufactured housing industry.*

Fall deaths occurring in manufacturing facilities are covered by general industry standards and would not be subject to Subpart M of part 1926. However, the assembly of manufactured housing on site would be covered by Subpart M as part of residential construction; fall fatalities occurring during this activity would be included among the estimated 160 fall fatalities occurring annually in the construction industry. OSHA does not know of any source which provides data on falls in the construction industry by the type of structure being constructed.

6. *Chairman Talent asked about OSHA's position on the employee-employer relationship between subcontractors and general contractors. OSHA stated that it would provide the agency's multi-employer worksite policy.*

OSHA utilizes an "economic realities" test to determine whether or not an employer-employee relationship does exist. That test consists of the following criteria:

- (1) Does the alleged employer have and exercise the right to control the details of the performance of the work? Does the alleged employer have the power to control the workers?
- (2) Whom do the workers consider their employer?
- (3) Who pays the workers' wages?
- (4) Who has the responsibility to control the workers?
- (5) Does the alleged employer have the power to hire, fire, and modify working conditions?

- (6) Does the workers' ability to increase their income depend on efficiency rather than initiative, judgement and foresight?
- (7) How are workers' wages established?
- (8) What is the level of the workers' skill?
- (9) Who owns and maintains the tools?
- (10) Do the workers work for other entities?
- (11) How long have the workers worked for the alleged employer?

The criteria enumerated above are not exhaustive. There may be additional factors which may have significance. It is only after review of all relevant factors that an accurate determination can be made as to the nature of an employment relationship.

OSHA's Multi-Employer Worksite Policy: On multi-employer worksites, both construction and non-construction, citations normally shall be issued to employers whose employees are exposed to hazards (the exposing employer). Additionally, the following employers normally shall be cited, whether or not their own employees are exposed:

- (1) The employer who actually creates the hazard (the creating employer);
- (2) The employer who is responsible, by contract or through actual practice, for safety and health conditions on the worksite; i.e., the employer who has the authority for ensuring that the hazardous condition is corrected (the controlling employer);
- (3) The employer who has the responsibility for actually correcting the hazard (the correcting employer).

Prior to issuing citations to an exposing employer, it must first be determined whether the available facts indicate that the employer has a legitimate defense to the citation, as set forth below:

- (1) The employer did not create the hazard;
- (2) The employer did not have the responsibility or the authority to have the hazard corrected;
- (3) The employer did not have the ability to correct or remove the hazard;

- (4) The employer can demonstrate that the creating, the controlling and/or the correcting employers, as appropriate, have been specifically notified of the hazards to which his/her employees are exposed;
- (5) The employer has instructed his/her employees to recognize the hazard and, where necessary, informed them how to avoid the dangers associated with it.
 - (a) Where feasible, an exposing employer must have taken appropriate alternative means of protecting employees from the hazard.
 - (b) When extreme circumstances justify it, the exposing employer shall have removed his/her employees from the job to avoid citation.
- (6) If an exposing employer meets all these defenses, that employer shall not be cited. If all employers on a worksite with employees exposed to a hazard meet these conditions, then the citation shall be issued only to the employers who are responsible for creating the hazard and/or who are in the best position to correct the hazard or to ensure its correction. In such circumstances the controlling employer and/or the hazard-creating employer shall be cited even though no employees of those employers are exposed to the violative condition. Penalties for such citations shall be appropriately calculated, using the exposed employees of all employers as the number of employees for probability assessment.

There has been a concern that when OSHA holds a general contractor responsible for overall site safety and health, an employer-employee relationship is established between the general contractor and the subcontractors. This relationship is then used to the contractor's detriment by other agencies such as the IRS. OSHA believes that holding the general contractor responsible for overall construction site safety does not, in itself, establish an employer - employee relationship between the general contractor and the subcontractors because such duties as site safety are normally delineated in contract language. Where subcontractors agree by contract to perform this duty there is no employee relationship established when the general contractor reminds or directs the subcontractor to meet the contractual obligations. Similarly, when the general contractor retains site safety responsibility there is no employee relationship established when directions are given to the subcontractor to do something safely. As stated by the Occupational Safety and Health Review Commission:

The general contractor normally has responsibility to assure that the other contractors fulfill their obligations with respect to employee safety which affect the entire site. The general contractor is well situated to obtain abatement of hazards, either through its own resources or through its supervisory role with respect to other contractors. It is therefore reasonable to expect the general contractor to assure compliance with the standards in-so-far as all employees on the site are affected. Thus we will hold the general contractor

responsible for violations it could reasonably have been expected to prevent or abate by reason of its supervisory capacity. [Grossman Steel and Aluminum Corp., 4 BNA OSHRC 1185, 1188, 1975-76 CCH OSHD §20,691, p. 24,791 (No. 12775, 1976)]

Such supervision is a normal and expected part of the general contractor's responsibilities and does not establish an employer-employee relationship.

Similarly, OSHA's Multi-Employer Worksite Policy does not establish an employer-employee relationship. It does establish that multiple employers may be responsible for individual hazardous conditions to which workers are exposed.

7. *Patti Burgio stated that she was not sure if the alternative plans for the residential construction industry covered the work conducted by a National Association of the Remodeling Industry. OSHA stated that there were no limitations to the plans' coverage of residential construction, and would provide a written explanation.*

OSHA recognizes that residential construction entails unique working conditions, where, depending on the building techniques used by the contractor, the use of conventional fall protection equipment (guardrail systems, safety net systems, or personal fall arrest systems) could be infeasible or create greater hazard, such as when setting roof trusses or erecting panelized walls. Thus, Subpart M of the fall protection rule allows the employer to develop and implement an alternative fall protection plan when the use of conventional fall protection systems is infeasible or creates a greater hazard to the worker. OSHA provides a sample fall protection plan, developed with input from the National Association of Homebuilders, in Appendix E of the fall protection rule.

While OSHA does not provide an exact definition of "residential construction," this includes new and remodeling work associated with the construction of single family homes, townhouses, duplexes and similar types of residential structures under 48 feet in height, excluding high rise apartment projects. Therefore, requirements for fall protection in residential construction, along with the built-in flexibility to use alternative fall protection methods in situations mentioned above, would also apply to remodeling work performed by members of the National Association of the Remodeling Industry.

8. *Chairman Talent asked OSHA to provide any estimation made of the number of injuries that would be caused by complying with the rule, particularly for the remodeling industry.*

OSHA believes that complying with the revised fall protection standard would not cause additional injuries. As Assistant Secretary Dear emphasized at the hearing, the standard is expected to prevent injuries by reducing risks to workers and will not increase hazards.

9. *Congresswoman Velazquez asked OSHA to submit any dialogue that OSHA has had with the Manufactured Housing Institute during the 9 year development of the rule.*

The Manufactured Housing Institute has never commented on the rule.

10. *Congresswoman Velazquez suggested to the witnesses representing industry that they consult OSHA for information on cheaper rates for fall protection equipment.*

Enclosed are documents showing cost estimates for fall protection equipment given to OSHA. Contrary to industry claims, full body harnesses can be purchased for as little as \$40 to \$80 each. According to several sources, the cost of a full body harness, rope grab with integral lanyard, and lifeline should not exceed \$250 per employee, significantly lower than industry's estimate of \$410. Lyons Safety offers a complete roof anchor/lifeline fall protection system, which includes roof anchors, cement coated nails, rope grab, universal fit full body harness, lifeline, instructions, and a training video for as low as \$375. OSHA estimates that for a \$400 roofer's kit with a life span of 5 years, the cost of the fall protection kit per year would be approximately \$80. Adding approximately \$50 per year for maintenance, the total cost of fall protection equipment would be \$130 per year per worker.

Again, thank you for the opportunity to respond to issues related to OSHA's Fall Protection Standard. If you have any further questions, please do not hesitate to contact me.

Sincerely,


Joseph A. Dear
Assistant Secretary

Enclosure

DESCENT CONTROL, INC.

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June 12, 1995

USDOL-OSHA
 200 Constitution Ave. NW
 Room N3621
 Washington, DC 20210

Attention: Barbara Blelaski Via Fax 202-219-7477
 Construction Standards

Dear Mrs. Blelaski:

As Chairman of the Fall Protection Group of ISEA, I would like to comply with your request on costs to roofing contractors of the following personal fall protection equipment:

1. Waist Belts \$25-\$50/ea.
2. Full Body Harnesses \$40-\$80/ea.
3. Rope Grabs \$40-\$80/ea.,
 a. With integral lanyards add \$25-\$50/ea.
4. Lifeline \$15-\$60 per 50 foot length.
5. Anchor Connectors \$10-\$2500/ea.
 a. discrepancy in cost is due to temporary (one time use) or re-usable devices.

It is significant you consider that:

1. Waist belts, full body harnesses, rope grabs and lifelines are reusable and have a recommended life of 5 years, unless shock loaded or damaged, at which time each item should be removed from service.

2. Cost per employee for a full body harness, rope grab with integral lanyard and lifeline should not exceed \$250 or \$50 per year providing each system has not been damaged or shock loaded.
3. One time use anchor connectors should cost no more than \$50 each and may be as low as \$10 per worker.
4. Multiple use anchor connectors are usually more complex devices that have alternate uses justifying their cost.

I hope this information is helpful. In addition, I will be available on Tuesday, June 27th between 11:00 AM and 3:00 PM to appear before SENRAC to discuss available fall protection equipment specific to this committee. Please confirm the time for my presentation.

Thank you for the continued open forum and cooperation OSHA provides for fall protection manufacturers in the quest to make US workers safer.

Very truly yours,

Michael Bell
CEO
DESCENT CONTROL, INC.

/s/

Let Lyons Safety Help You Comply with the Newest OSHA Construction Standard.

The new OSHA construction fall protection standard (29 CFR 1926 Subpart M) has rigorous requirements for equipment, training, and fall protection plans. These products from Miller's Equipment, and the expert training and support Lyons provides can help your company comply with the new standard whose requirements include:

- Fall protection beginning at 6 feet.
- Required fall protection plans.
- Employee training.
- Full body harnesses instead of belts (1/98).

A. Miller's Manyard® Shock Absorbing Lanyard

Shock-absorbing lanyards significantly reduce fall arresting forces by as much as 80 percent. The Manyard® contains a shock-absorbing inner core that elongates when subjected to a fall, thereby reducing the force. After a fall occurs, the Manyard® releases a warning flag to indicate a replacement is needed. The Manyard® is pictured in use with a Miller® universal fit full body harness and 6" nylon cross arm strap.

Item No.	Description	Each
H956210	6" Shock-Absorbing Manyard with locking snap hooks	\$50.85
H956078	Universal Fit Body Harness	67.00
H956160	6" Nylon Cross Arm Strap	34.95

B. Roof Anchor / Lifeline Fall Protection System

For roofers, the roof anchor/lifeline fall protection system is OSHA compliance in a bag. Contents: 12 roof anchors, 72 cement coated nails, shock-absorbing rope grab, universal fit full body harness, 25' or 50' 3/4" nylon rope lifeline, instructions, and training video. Can be installed on roof peak or flat roof surface in minutes using only a hammer.

Item No.	Description	Each
H956136	25' System	\$375.00
H956137	50' System	410.00

For our complete line of fall protection equipment refer to pages 59-61.



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BARBARA BIELASKI

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EZSTOP E-2 STOP SHOCK ABSORBER 7/16" L	1.00	EA	33.36	EA	33.36			
LANYARD30 LANYARD 15' - 30' ADJUSTABLE	1.00	EA	55.62	EA	55.62			
HARNESB FULL BODY HARNESS	1.00	EA	72.11	EA	72.11			

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119



June 21, 1995

VIA FAX

202-219-7477

Ms. Barbara Bielaski
Occupational Health & Safety Admin.
Washington, DC

Re: Cost of Roof Worker Restraint System (Our file STDREG\OSH1926)

Dear Barbara:

Relative our recent phone conversation on the captioned subject, this is to confirm that, in our opinion, there are several systems of PPE on the market that provide restraint (positioning and/or travel restriction) which can be purchased for \$250 or less. These systems would meet the requirements of 29 CFR 1926, Subpart M.

Such systems include a full body harness, an anchorage line, a lockable adjuster on the line, and the associated connectors. Harnesses are available for under \$75 and the other equipment (with 50 feet of anchorage line) costs under \$175.

As chairman of both the ANSI Z359 Committee and USTAG, I am quite familiar with what is available on the market from both domestic and foreign suppliers.

If you have any questions or need additional information on this subject, please be in touch.

Very truly yours,

ROSE MANUFACTURING COMPANY

Terry L. Schmidt
President

Ex. 1

Tuesday
November 25, 1986

Part III

Department of Labor

Occupational Safety and Health
Administration

29 CFR Part 1926

Safety Standards for Fall Protection in
the Construction Industry; Notice of
Proposed Rulemaking

Federal Register

DEPARTMENT OF LABOROccupational Safety and Health
Administration**29 CFR Part 1926**

[Docket No. S-206]

**Safety Standards for Fall Protection in
the Construction Industry**AGENCY: Occupational Safety and
Health Administration, Labor.**ACTION: Notice of Proposed Rulemaking.**

SUMMARY: The Occupational Safety and Health Administration (OSHA) proposes to revise the construction industry safety standards addressing fall protection. The standards proposed for revision regulate the design and use of fall protection systems and procedures used in construction to prevent employees from falling into or through working levels, falling to lower levels, and to protect employees from falling objects.

The proposed revisions are intended to correct problems found in the existing standards which regulate in detail the specific methods to be used to reduce employee exposure to the hazards of falling and of being struck by falling objects. The proposed revisions would continue to address the hazards to which employees are exposed, but would do so using performance criteria where possible, rather than specification standards. The proposed revisions would also consolidate and simplify many of the existing provisions. For example, paragraph § 1926.104 Safety belts, lifelines, and lanyards, and paragraph § 1926.105 Safety nets, would be relocated to the proposed subpart. This approach is another step in OSHA's plan to review its safety standards and to revise them as necessary to provide safer working conditions without imposing unnecessarily burdensome requirements. This proposal is being issued after appropriate consultation with the Advisory Committee on Construction Safety and Health (ACCSH).

DATES: Comments on this proposed rulemaking must be postmarked by February 23, 1987. Hearing requests must be postmarked by February 23, 1987.

ADDRESS: Written comments and requests for hearings should be sent to the Docket Officer, Docket No. S-206, U.S. Department of Labor, Room N-3670, 200 Constitution Avenue, NW., Washington, DC 20210.

FOR FURTHER INFORMATION CONTACT: Mr. James Foster, Occupational Safety and Health Administration, U.S.

Department of Labor, Room N-3637, 200 Constitution Avenue, NW., Washington, DC 20210. Telephone (202) 533-8151.

SUPPLEMENTARY INFORMATION: The author of this proposed rulemaking is Roy F. Curnham, Office of Construction and Civil Engineering Safety Standards, Occupational Safety and Health Administration.

I. Background

Congress amended the Contract Work Hours Standards Act (CWHSA) (40 U.S.C. 327 et seq.) in 1969 by adding a new section 107 (40 U.S.C. 333) to provide employees in the construction industry with a safer work environment and to reduce the frequency and severity of construction accidents and injuries. The amendment, commonly known as the Construction Safety Act (CSA) (Pub. L. 91-54; August 9, 1969), significantly strengthened employee protection by providing occupational safety and health standards for employees of the building trades and construction industry working on Federally-financed or Federally-assisted construction projects. Accordingly, the Secretary of Labor issued Safety and Health Regulations for Construction in 29 CFR Part 1518 (36 FR 7340, April 17, 1971) pursuant to section 107 of the Contract Work Hours and Safety Standards Act.

The Occupational Safety and Health Act (the Act) (84 Stat. 1590; 29 U.S.C. 651 et seq.), was enacted by Congress in 1970 and authorized the Secretary of Labor to adopt established Federal standards issued under other statutes, including the Construction Safety Act, as occupational safety and health standards. Accordingly, the Secretary of Labor adopted the Construction Standards, which had been issued under the Construction Safety Act in 29 CFR Part 1518, in accordance with section 6(a) of the Act (36 FR 10466, May 29, 1971). The Safety and Health Regulations for Construction were redesignated as Part 1926 later in 1971 (36 FR 25232, December 30, 1971).

The standards in Subpart E—Personal Protective Equipment, including § 1926.104—Safety Belts, Lifelines, and Lanyards, and § 1926.105—Safety Nets, were among the standards adopted by OSHA through the section 6(a) process. The standards in Subpart M—Floor and Wall Openings, and Stairways § 1926.500, were also adopted by OSHA through the section 6(a) process and have been amended several times under section 6(b) of the OSH Act. The above mentioned provisions in Subparts E and M of Part 1926 relate to fall protection and are the subject of this proposed revision.

As part of OSHA's continuing program of standards evaluation and in response to public comments, a complete review of Subpart M was begun in 1977. Since then, the ACCSH has reviewed Subpart M six times and has submitted transcripts of these meetings, including recommendations, to the Assistant Secretary. The transcripts are part of the public record as Exhibit

1. The Committee's recommendations, and those of other interested parties, have been carefully analyzed in connection with the present rulemaking. Many of the changes in the standard being proposed reflect the recommendations and suggestions of the Advisory Committee and interested persons. Relevant ACCSH comments are discussed below in the Summary and Explanation section. Committee discussions that were inconclusive or did not produce a specific recommendation have also been considered, but are not discussed in this preamble.

OSHA believes that many of the existing provisions relating to fall protection are redundant or ambiguous, and in some places may actually increase employee exposure to fall hazards. Other provisions simply are not feasible in all situations. To eliminate these problems and to encourage compliance by employers and employees, this proposal focuses on the principal hazards involved when working in elevated areas. In addition, the proposal has been written in performance-oriented language. This proposal also incorporates directly relevant provisions of the general industry standards (Part 1910) which have been determined by OSHA to be applicable to the construction industry.

For purposes of organization, the topic of stairways will be relocated from existing Subpart M to a proposed revised Subpart X titled "Stairways and Ladders." These two subparts, along with a revised Subpart L, entitled "Scaffolds," constitute a package of interrelated standards which have been rewritten and reorganized to facilitate treatment of the individual subjects. OSHA intends to coordinate the rulemaking activities for these three subparts, and hopes to make the final rules for all three subparts effective at the same time.

OSHA believes that the clarified and revised language of the proposal will help employers to understand the requirements of Subpart M, and will improve safety by minimizing subjective interpretations of the provisions. By minimizing, if not eliminating, the interpretations needed to understand

the requirements of Subpart M. OSHA intends to provide fair and equal notice to all employers of the rules for fall protection.

This project is also being coordinated with the project for the revision of related general industry standards in 29 CFR Part 190 Subpart D—Walking/Working Surfaces. Wherever possible, the 1910 and 1926 proposals use the same language to address similar hazards in order to promote consistency between the two sets of standards.

II. Hazards Involved

Fall accidents resulting in injuries and fatalities continue to occur at construction sites despite the development and promulgation of the OSHA Construction Standards in 1971. Examination of available data indicate that these accidents appear to be primarily the result of non-compliance with existing OSHA standards, and not because the standards improperly address the fall hazards involved in construction. However, after review of compliance problems and public comments received since 1972, OSHA believes that the present standard needs updating to clarify the requirements of some currently ambiguous and confusing provisions. In addition, OSHA believes that reformulating the requirements into a more logical grouping of topics will allow employers to more easily determine what they must do.

Precise fall hazard accident data for the entire construction industry are not available. Falls are reported according to the nature of the injury and the surface involved, but no match is made between the two categories. In addition, although the number of construction fall accidents can be estimated for a given period of time, the ratio of accidents to the amount of employee exposure to fall hazards cannot be readily determined. However, based upon the limited data which have been compiled, it can be estimated that as many as 41,000 injuries due to falls from elevations covered under Subpart M occurred in 1979 alone, not including those falls which resulted in fatalities (Ex. 2: Table IV-1).

Although specific accident ratios cannot be projected for the 4 million construction workers potentially covered by Subpart M, the following examples of recorded accidents illustrate the types of fall accidents that injure and kill construction employees. The list reflects selected examples and is not intended to represent all the types of falls that occur.

• August 26, 1977: Fatality. While installing shingles on a roof with a pitch

greater than 4 in 12, an employee lost his balance and fell 16 feet to his death (Ex. 3:19). Observance of existing provisions § 1926.28(a) and § 1926.104, or the clarified language of proposed paragraph § 1926.501(c), might have prevented this death by protecting the employee with a body belt or harness system.

• October 17, 1976: Fatality. While painting near a roof edge, an employee slipped and fell 50 feet to the ground below. Although told to wear a body belt prior to the accident, the employee was not wearing a body belt at the time of the accident (Ex. 3:21). Observance of existing provisions § 1926.28(a) and § 1926.104, or the clarified language of proposed paragraphs § 1926.501(b)(1) and (c), might have prevented this death by protecting the employee with a body belt, body harness, safety net, or guardrail system.

• December 5, 1974: Fatality. While leaning out over the roof edge to reach an object on the end of a hoist, an employee lost his balance and fell 30 feet (Ex. 3:22). Observance of existing provisions § 1926.28(a) and § 1926.104, or the clarified language of proposed paragraph § 1926.501(b)(3), might have prevented this death by protecting the employee with a body belt or body harness system during hoist operations.

• May 17, 1977: Fatality. While cleaning up the work area, an employee lost his balance near the edge and fell 25 feet (Ex. 3:13). Observance of existing provision § 1926.500(d)(1), or the proposed paragraph § 1926.501(b)(1), might have prevented this accident by protecting the employee with a guardrail system while working near a floor edge.

• November 12, 1977: Fatality. While walking backward pulling a hot tar spreader, an employee stepped into an unguarded roof opening and fell 25 feet (Ex. 3:35). Observance of existing provision § 1926.500(b)(1), or the proposed paragraph § 1926.501(b)(4), might have prevented this accident by protecting the employee with a guardrail system or a cover placed over the roof opening.

A study of 99 fall related fatalities (Ex. 2) suggests that almost all of the deaths could have been prevented by the use of guardrails, body belts, body harnesses, safety nets, covers, or other means which would reduce employee exposure to the fall hazard. All such accidents are complex events of course, and multiple issues must be addressed in order to protect against the human and equipment factors which can result in injury or death. Among these issues are knowledge of where protection is required; the types of appropriate systems for given situations; the proper

construction and installation of safety systems; and proper supervision, work procedures, and training. Each of these topics is covered in the proposed revisions to Subpart M. The proposal concentrates on hazard identification and includes specific training requirements to supplement the general training provisions of § 1926.21, in addition to clarifying the existing provisions, the proposal provides coverage not contained in the existing Subpart M. For example, steep roofs are not identified in the existing Subpart M, but are covered in the proposal.

For a further discussion of accident rates and significance of risk, see *Section IV. Preliminary Regulatory Impact Assessment and Regulatory Flexibility Analysis*.

III. Summary and Explanation of the Proposal

The following discussion explains significant substantive changes to the existing standard.

Subpart M—Fall Protection. The title of Subpart M is proposed to be changed from "Floor and Wall Openings, and Stairways" to "Fall Protection." The existing standard contains provisions which regulate fall protection in many areas and not just for floors, wall openings, and stairways. For example, roofs, floor perimeters, floor holes, dangerous equipment, ramps, runways, and stairway construction are all included in the existing scope of Subpart M. However, the existing title does not reflect this scope of coverage. The proposed title for Subpart M more accurately reflects the topics covered. I.e., fall protection systems and practices. In addition, to make Subpart M a more comprehensive set of fall protection standards for construction, the provisions of § 1926.104—Safety belts, lifelines, and lanyards; § 1926.105—Safety nets; and the current fall protection provisions of paragraphs § 1926.651(i), § 1926.651(w), § 1926.700(b)(1), would all be revised and relocated to Subpart M. As discussed earlier, the topic of stairways is proposed to be relocated to a new revised Subpart X—Stairways and Ladders, as this topic also includes other rules which are not related to fall protection.

In the following discussion, a paragraph citation preceded by the letter "E" refers to a paragraph in the existing standard. All other citations are to the proposed standard.

§ 1926.500 Scope, application, and definitions applicable to this subpart. Paragraph § 1926.500(a) outlines the scope and application of the entire

Subpart M. The proposal would apply to all walking/working surfaces found in construction, alteration, repair (including painting and decorating), and demolition workplaces except for five specific areas: Fall protection for scaffolds would be as provided in proposed Subpart L—Scaffolds. The requirement to have fall protection on specified pieces of construction equipment would remain in Subpart N—Cranes, Derricks, Hoists, Elevators, and Conveyors, and Subpart O—Motor Vehicles, Mechanized Equipment, and Marine Operations; however, the systems required by Subparts N and O would have to conform to the provisions of proposed Subpart M. Additional requirements to have fall protection for connectors and for workers on derrick and erection floors during steel erection would remain in Subpart R—Steel Erection. Similarly, the requirement to have fall protection during tunnel operations is contained in Subpart S—Tunnels and Shafts, Caissons, Cofferdams, and Compressed Air. Additional requirements for fall protection during power transmission and distribution work would remain in Subpart V—Power Transmission and Distribution. Fall protection for stairways and ladders would be placed in a new proposed Subpart X titled "Stairways and Ladders." All activities and locations not specifically addressed in the above subparts would be governed by the provisions of Subpart M.

The scope of Subpart M is limited in paragraph §1926.500(a)(1) by providing that fall protection is not required when employees are inspecting, investigating, or assessing workplace conditions. An example of this kind of work is where an employee goes onto a roof which needs to be repaired in order to investigate the existing condition of the roof and to estimate the amount of work involved. During this inspection, there is no requirement for the employee to be protected by a guardrail, body belt, body harness, safety net, or other safety system. This exception is made because these operations are normally conducted in good weather, the nature of such work normally exposes the employee to the fall hazard for a short time, if at all, and installation of fall protection systems for short durations is not feasible without exposing the installers of the system to the same hazard, but for a longer time. In addition, employees doing this type of work are more likely to be aware of their proximity to an unprotected edge than, for example, a roofer who is moving backwards while operating a felt laying machine, or a

plumber whose attention is on overhead pipe and not on the floor edge.

Paragraph §1926.500(b) lists and defines all major words used in the proposed standard. Many of the definitions are the same as those in the existing standard, although some have been reworded for uniformity or clarity. The following words have been added or have been changed from the existing definitions:

"Body belt." This definition replaces the existing term "safety belt" to reflect current industry use of the new term.

"Body belt/harness systems." This term is used to describe any combination of body belt or body harness, and lifelines, lanyards, and deceleration devices.

"Body harness." This term is used to describe a system of straps, worn by an individual, that distributes the arresting forces, generated by a fall, over the individual's thighs, shoulders, and pelvis.

"Built-up roofing." The description of single-ply systems is reworded to indicate that a layer of adhesive is often part of the finished product, but not always. The definition is also reworded to indicate that any of the systems described may be covered by a layer of mineral aggregate, not just the multiple-ply systems.

"Control zones." This term refers to designated areas where overhead bricklaying operations are taking place or a leading edge is being constructed. In these areas, conventional fall protection systems (body belts, safety nets, and guardrails) would not be required, and access to these areas would be restricted to employees performing the aforementioned operations (see discussion of §1926.501(b) (2) and (9) below).

"Dangerous equipment." This term is used to refer to equipment such as galvanizing tanks, machinery, electrical equipment and similar hazards.

"Deceleration device." This term describes the equipment used to bring a falling employee to a stop without injury.

"Deceleration distance." This term is used to describe the distance an employee falls (excluding lifeline elongation) after free falling.

"Equivalent." This term is used in the proposal to allow alternative means of complying with the standards. The definition makes clear that the employer must demonstrate that all alternative means of compliance will provide an equal or greater degree of safety than that attained by using the method or item specified in the standard.

"Failure." This word is used in performance-oriented paragraphs as §§ 1926.502 (b)(3) and (b)(4) deal with guardrail strength. The definition makes it clear that, along with breakage and separation of component parts, refusal (the point where the ultimate strength of a component is exceeded, also considered to be failure. This is point where structural members lose their ability to carry loads.

"Force factor" means the ratio of the arresting force generated on a rigid metal object to the arresting force generated on a human body having the same weight as the object, when the object and body fall under identical conditions. This factor is used to contrast results (see Appendix C) using a rigid metal object to results which would be expected if a human test subject of the same weight were used the test.

"Free fall distance." This term is used to describe the distance an employee moves during a fall before a deceleration device is activated.

"Guardrail system." This term, which defines guardrails as vertical barriers erected to prevent employees from falling, replaces the existing term "standard railing."

"Hole." This term is used to identify all holes and openings in floors, roofs, and other walking/working surfaces. The existing standard addresses holes and openings as separate topics; however, the treatment of each is essentially the same. Therefore, to eliminate confusion, the proposal uses the word "hole" to describe all holes and openings in floors, roofs, and other walking/working surfaces. The term "opening" in the proposal applies only to holes and openings in walls. Specifically, the term "hole" is defined as any hole or other opening more than two inches in its least dimension. This is a change from the one inch dimension used in the existing definition for "floor hole." This change is made to address more reasonably the problem caused by small holes at a construction site. Small holes are commonplace during construction and it is neither necessary nor feasible to guard each one. Holes less than two inches wide do not pose a significant hazard and the definition is changed accordingly.

"Leading edge." This new term is used to describe that portion of a floor, roof, or formwork which is under construction and where, consequently, the edge from which employees could fall is constantly changing location as construction progresses. (See discussion of leading edges in the explanation of paragraph § 1926.501(b)(2) below.)

"Lower levels." This term is used to describe the areas to which an employee could fall. The definition does not apply to the surface on which the employee is performing work duties.

"Mechanical equipment." This term is essentially the same as E § 1926.502(p)(4) except the proposed wording clarifies that this term applies only to built-up roofing work.

"Overhand bricklaying." This activity is identified in paragraph § 1926.501(b)(3) as having unique fall protection requirements. This definition clarifies the activities involved.

"Positioning device system." This new term identifies a piece of equipment used in construction which allows an employee to work with both hands free while the employee is standing in such a way (such as leaning backward) that a fall could result. Such devices are often used on formwork construction and concrete rebar placement.

"Steep roof." This refers to roofs with slopes greater than "low-pitched" roofs.

"Unprotected sides and edges." This term is essentially the same as existing definition E § 1926.502(p) which says that such areas on roofs are those where there is no wall three feet or more in height. However, the new definition has been broadened to include guardrail systems as well as walls, and applies to definitions to floors and other walking/working surfaces as well as roofs. The new definition also replaces the existing three foot limit with a 39 inch limit. The new limit conforms to the lower limit for guardrail height specified in paragraph § 1926.502(b)(1).

"Walking/working surface." This term is used to clarify the scope of the standard's application and includes all surfaces except ladders, vehicles, and trailers. However, the scope limitations discussed in paragraph § 1926.500(a) still apply.

"Warning line system." This term is used to describe a fall protection system which may be used to protect roofers during the application of built-up roofing on low-pitched roofs.

§ 1926.501 Requirements to have fall protection. This section specifies the places and areas where fall protection systems would be required. The specifics of the fall protection systems, and the training necessary to use the systems properly, are covered in succeeding §§ 1926.502 and 1926.503, respectively.

Paragraph 1926.501(a) General. This proposed paragraph requires that all fall protection systems required by § 1926.501 conform to § 1926.502.

Paragraph 1926.501(b) Floors, low-pitched roofs, and other walking/working surfaces. This paragraph

requires fall protection to be used on all floors, low-pitched roofs, and other walking/working surfaces with unprotected sides or edges. By definition, a floor, roof, or other walking/working surface is unprotected along its edge if there is no wall (including parapets) or guardrail system at least 39 inches in height (an exception is made, of course, at point of access). Except during the performance of built-up roofing work and except when working near dangerous equipment, fall protection is required wherever the fall distance is six feet or more. This is the same requirement as in E § 1926.500(d)(1). The four foot requirement in E § 1926.500(d)(2) for runways is changed to six feet in the proposal for purposes of consistency.

In general, guardrail systems are the only fall protection systems allowed at unprotected sides or edges of floors, low-pitched roofs, and other walking/working surfaces. This is essentially the same requirement as E § 1926.500(d)(1) except the proposal would allow the use of body belt/harness systems or safety net systems when the supporting surface is less than 18 inches wide (see § 1926.501(b)(1)). This change is proposed because OSHA believes it often can be impractical to erect guardrail systems on such narrow platforms. The 18-inch limit is consistent with the existing rule for ramps and runways, E § 1926.500(d)(3). In addition, the proposal recognizes a number of operations and areas where a guardrail system may not be a feasible or appropriate way of providing fall protection along unprotected sides and edges. Paragraphs (b)(2) through (10) identify these areas and operations and specify which fall protection systems are appropriate for the protection of employees. All other unprotected sides and edges must be provided with the systems as required by paragraph § 1926.501(b)(1). Public comment is requested on this point in Issue Number 2.

Paragraph (b)(2) addresses the problem of fall protection near leading edges. As defined in this proposal, a leading edge is that portion of a floor (or roof, or formwork surface) under construction which is an edge from which an employee could fall until placement of the next floor sections.

Because the time lapse between placement of successive sections is often only a few minutes, guardrail systems erected along a leading edge have to be removed almost as soon as they are erected to allow placement of the next section. Therefore, OSHA believes that a requirement to have

guardrail systems often is not feasible along leading edges.

OSHA also believes that a requirement to erect safety nets often is not feasible because of insufficient room to rig a safety net and because the net would have to be constantly moved. In addition, OSHA believes that body belts and harnesses are not always appropriate means of fall protection along leading edges as they limit an employees' freedom of movement which can hinder job performance as well as impair an employee's ability to avoid a misdirected incoming piece of concrete or other structural member used on the leading edge.

In addition, the erection of some structural members requires employees to walk along a leading edge during placement of the member. A body belt or harness can unacceptably impede this effort. However, because guardrail systems, safety net systems, and body belt/harness systems can be used feasibly in some situations, paragraph (b)(2)(i) would allow their use as fall protection for employees constructing leading edges. In addition, because of the aforementioned problems with conventional systems, OSHA is proposing to allow a safety monitoring system to be used to protect leading edge workers. Safety monitoring systems, discussed in detail below in paragraph § 1926.502(h) are patterned after the systems allowed for use during built-up roofing operations. (see E § 1926.500(g)).

Paragraph (b)(2)(ii) requires guardrail systems or control zone systems to be erected along leading edges to protect workers who are not constructing leading edges, but who are on a walking/working surface which has a leading edge. This requirement applies only to the leading edge hazard. Other unprotected sides and edges of the walking/working surface must be guarded as required by the other provision of paragraph (b). No other system would be allowed because OSHA believes these two systems to be the only practical way of protecting non-leading edge workers while, at the same time, keeping these workers out of the area where leading edge work is being performed. A control zone, discussed in detail in paragraph § 1926.502(g) below, is simply a visual and physical barrier which prevents employees from inadvertently entering the area immediately adjacent to the leading edge.

Paragraph (b)(3) requires employees in hoist areas to be protected by body belt/harness systems when they are leaning through hoist area access

openings, and by either body belt/harness systems or guardrail systems at all other times. This is essentially the same requirement as E§ 1926.500(g)(5) which applies only to hoisting operations on low-pitched roofs during built-up roofing operations, except the proposal would extend the rules to all hoisting operations on floors as well as low-pitched roofs. Also, the proposal would apply to equipment hoisting areas in addition to materials handling areas.

Paragraph (b)(4) requires that all holes in floors, low-pitched roofs, and other walking/working surfaces be guarded by covers or guardrails. The existing standard contains separate specific rules for floor openings, roof openings, platform openings, hatchways, chutes, pits, etc. However, the proposed standard treats most holes as presenting the same type of hazard and does not address each individual type of hole separately. Paragraph (b)(4)(i) requires covers to be closed when holes are not in use, and paragraph (b)(4)(ii) requires guardrails to be erected around holes when covers have been removed. These are essentially the same requirements as E§ 500(b)(3)(i), (b)(5), (b)(6), and (b)(8).

Paragraph (b)(5) requires employees working on formwork and reinforcing steel to be protected by a body belt/harness system, safety net system or positioning device system. Positioning devices are essentially body belts which are attached by short lanyards to the work surface, and which allow the worker to perform a job with both hands free. Because of the short length of the lanyard, approximately nine to 16 inches depending on how it is rigged, OSHA believes there is no significant fall hazard when positioning devices are used. The existing standard does not address positioning devices.

Paragraph (b)(6) requires ramps, walkways, bridges, and runways to be equipped with guardrails. This is essentially the same requirement as in E§ 1926.500(d)(2) and E§ 1926.651(w), except that the four foot limit is replaced by a six foot limit to make it conform with the other fall protection provisions, and all walkways and bridges would be covered, not just those over excavations.

Paragraph (b)(7) requires the edges of inconspicuous excavations to be provided with guardrail systems, fences, signs, or barricades to prevent employees from falling into them. In addition, walls, pits, shafts, and similar excavations shall be guarded. These are essentially the same requirements as contained in E§ 1926.651(t), which is proposed to be relocated from Subpart P to Subpart M because it addresses fall protection. However, the term "remotely

located" contained in E§ 1926.651(t) is deleted and the hazard is described in terms of the excavation's visibility. Although excavations are not generally required to be provided with guardrail systems, OSHA believes that excavations which are obscured from view, because of plant growth or other visual barrier, do require protective barriers. Public comment is requested in the Specific Issues section of this preamble as to whether or not signs are appropriate means of protection for this hazard.

Paragraph (b)(8) sets out requirements to protect employees from falling into dangerous equipment. The requirement provides that where the floor, roof, or walking/working surface is less than six feet above such hazards, employees shall be protected by guardrails or equipment guards that shield the hazard. For employees on floors, roofs, and other walking/working surfaces six feet or more above dangerous equipment, guardrail systems, body belt/harness systems, or safety net systems shall be used. "Dangerous equipment" is defined as equipment such as pickling or galvanizing tanks, degreasing units, machinery, electrical equipment and other units which are hazardous in nature because of their form or function. These requirements and the definition are based on E§ 1926.500(d)(4) and (5).

Paragraph (b)(9) addresses the fall protection requirements for employees engaged in overhand bricklaying operations and related work. These employees are involved in the construction of masonry walls and must lean over the wall to complete the joint work. Related work which is also covered by this paragraph includes mason tending and electrical work which must be incorporated into the brick wall during the bricklaying process.

While the use of guardrails, body belts, body harnesses, and safety nets is allowed during overhand bricklaying, the use of such systems often is not feasible. Guardrails pose obvious interference problems and safety nets cannot be attached to many load-bearing or other brick walls as such walls are not capable of supporting the loads imposed by a net system. Body belt/harness systems often become entangled in close quarters and in those cases where suitable anchorages can be found, lanyards and lifelines pose serious tripping hazards to the mason tenders who could themselves trip and go over the edge. Therefore, after extensive consultation with the Mason Contractors of America, the International Union of Bricklayers and Allied Craftsmen, the Laborer's

International Union of North America, and the ACCSH, the use of a control zone is proposed to be allowed for the protection of employees performing overhand bricklaying and related work.

A control zone, discussed in detail in paragraph § 1926.502(g) below, is simply a visual and physical barrier which prevents non-overhand bricklaying employees from inadvertently entering the area immediately adjacent to the fall hazard. It also designates the area where overhand bricklaying may be performed without the use of guardrails, body belt/harnesses, or safety nets as fall protection. However, paragraph (b)(9)(ii) provides that if the overhand bricklayer must reach more than 10 inches below the walking/working surface, then control zones may not be used to protect such employees. Instead, such employees must use conventional fall protection systems. This requirement is proposed because the consensus opinion of the bricklaying industry and trade (Ex. 1, December 18, 1980) is that this additional leaning presents a sufficient fall hazard to warrant requiring physical restraints for fall protection, i.e., guardrail, body belt/harness, or safety net systems, despite any feasibility problems.

The exceptions listed in paragraph (b)(9) clarify which provisions of paragraph (b) apply when bricklaying employees are engaged in work activities that are covered by more than one paragraph. For example, a worker performing overhand bricklaying work near a floor hole would have to be protected as required by paragraph (b)(4) with regard to the hole. Another example is a worker performing overhand bricklaying work above dangerous equipment. The provisions of paragraph (b)(6) would apply, and a control zone could not be used. Similar exceptions apply for hoisting areas and ramps and runways. These exceptions are made because OSHA views each of these areas to be more hazardous than the unprotected sides and edges generally encountered by overhand bricklaying workers.

Paragraph (b)(10) applies to employees performing built-up roofing work on low-pitched roofs with unprotected sides and edges 16 feet or more above lower levels. Such employees shall be protected by conventional fall protection systems (guardrail systems, body belt/harness systems, safety net systems), a combination of warning line and conventional system, a combination of warning line and safety monitoring system, or safety monitoring system alone in certain specified conditions.

This is the same requirement as E § 1926.500(g)(1) except the existing language uses the terms "ground" and "eaves" as the points between which the 16-foot height criteria is to be measured. The proposal uses the terms "unprotected sides and edges" and "lower levels" to eliminate confusion, as some roofs do not have eaves, and other roofs are more than 16 feet above the ground but less than 16 feet above the nearest lower level (penthouse roofs for example). The Note at the end of this paragraph clarifies the scope of paragraph (b)(10) by specifying that employees performing built-up roofing on low-pitched roofs with a fall distance less than 16 feet are not required to have any of the fall protection systems required for higher work. This is the intent of E § 1926.500(g) which was developed during a 1980 rulemaking (see 45 FR 75618), and this position is supported by the National Roofing Contractors Association, the National Home Builders Association, the United Union of Roofers, Waterproofers, and Allied Workers, and other groups, and has been reviewed by the ACCSH.

The other provisions of E § 1926.500(g) have been relocated to various paragraphs in this revision of Subpart M. However, they have not been changed substantively as they apply to built-up roofing. For example, the E § 1926.500(g)(5) provisions on hoisting have been moved to paragraph (b)(3) and are proposed to apply to all hoist areas, not just those on low-pitched roofs. Similarly the E § 1926.500(g)(3) provisions for warning lines are moved to § 1926.502(f). All such changes are explained in the discussion for each paragraph where the provisions have been relocated.

Paragraph (b)(10) has four exceptions which limit its application to built-up roofing operations. These are the same exceptions as those for overhand bricklaying operations discussed in paragraph (b)(9) above: hoisting areas; holes; ramps and runways; and dangerous equipment. The reasons for these exceptions are the same as those discussed for overhand bricklaying.

Paragraph 1926.501(c) Steep roofs. This paragraph requires employees on roofs with slopes steeper than four in 12 (i.e., four inches vertical to 12 inches horizontal) to be protected from falling when the roof has unprotected sides or edges more than six feet above lower levels. The fall protection must consist of guardrail systems, body belt/harness systems, or safety net systems. Existing Subpart M does not specifically address steep roof fall protection requirements. Consequently, the following provisions

outside Subpart M have been utilized as the basis for citations for inadequate fall protection on steep roofs: § 1926.26(a) Personal protective equipment; § 1926.104 Safety belts, lifelines, and lanyards; § 1926.105 Safety nets; § 1926.451(u)(3) Catch platforms; as well as section 5(a)(1) of the Occupational Safety and Health Act of 1970. The proposed provision explicitly sets out the required fall protection systems for steep roofs.

Paragraph 1926.501(d) Wall Openings. This provision consolidates, clarifies, and changes the existing requirements of E § 1926.500(c)(1) and (3). Under the proposal, wall openings, defined as openings 30 inches or more high and 18 inches or more wide, which have a bottom edge to lower level fall distance of six feet or more on the side away from the employees, and a bottom edge to walking/working surface height of less than 39 inches on the side facing the employees, must be provided with a guardrail system to protect employees. This is a change from E § 1926.500(c)(1) which requires such protection to be provided when the fall distance exceeds four feet, and when the near side height is less than 36 inches. These changes are made to make this rule compatible with the six foot rule of paragraphs § 1926.501(b) and (c), the minimum height requirements for guardrail systems of paragraph § 1926.502(b)(1), and the definition of "unprotected sides and edges." The existing requirement in E § 1926.500(c)(2) for guardrails on extension platforms would be deleted as being redundant with the provisions for outrigger scaffolds covered in proposed Subpart L—Scaffolds.

Paragraph 1926.501(e) Protection from falling objects. This paragraph requires protective measures to be taken or barriers to be erected to shield employees who are exposed to the hazard of falling objects. The provision would apply only where there are employees below a walking/working surface or wall opening from which an object could fall. This is a change from existing rules E § 1926.500(b)(1), (2), (3)(ii), and (8) which require toeboards to be erected around floor, roof, and platform holes and openings regardless of whether or not employees are working below. However, the proposed rule is consistent with the intent of E § 1926.500(d)(1) which requires toeboards only where employees below are exposed to hazards from falling objects.

OSHA believes the listed alternatives for providing falling object protection are more feasible than the present requirements to use only toeboards or

screens. In addition to toeboards and screens, the proposal allows guardrails, protective canopies, signs, or barricades to be erected, or else the potential fall items must be placed away from the edge a distance sufficient to prevent them from going over the edge should they be accidentally displaced. This distance is not specified as it varies depending on the shape of the objects. Round objects such as rolls of roofing felt would require more distance than a stack of flat shingles. The distance also depends on the height of the object or pile of objects. OSHA believes these provisions to be appropriate means and ways of protecting against the hazards of falling objects. However, public comment is requested in the Specific Issues section of this preamble as to whether or not signs are appropriate means of protection for this hazard.

§ 1926.502 Fall protection systems criteria and practice. This section specifies the performance and practice requirements to be met when fall protection is required by § 1926.501 and other subparts in Part 1926. The following discussion highlights changes from or additions to the existing standard. Where provisions are essentially unchanged, they are, in the main, not discussed.

Paragraph 1926.502(a) General. This paragraph requires all fall protection to conform to the following provisions, as applicable, and to be provided and installed before employees begin any other work on or from the surface to be protected. To be fully effective, fall protection must be in place at the earliest possible time.

Paragraph 1926.502(b) Guardrail systems. This paragraph sets forth the requirements for all guardrail systems. Paragraph (b)(1) specifies that the top edge of guardrail systems shall be 42 inches, plus or minus three inches, above the walking/working surface. The existing requirement of E § 1926.500(f)(1) is that the guardrail system be "approximately 42 inches from upper surface of top rail to floor, platform, runway, or ramp level." The revised language deletes the term "approximately" and establishes that the height requirement applies on all installations, not just those on floors, platforms, runways, and ramps. Paragraph (b)(2) requires midrails, screens, mesh, intermediate vertical members (i.e., balusters), solid panels, or equivalent structural members to be installed between the top edge of the system and the walking/working surface when there is no wall or parapet wall at least 21 inches high. This is essentially the same requirement as

E § 1926.500(f)(1)(vi)(c). Paragraph (b)(2)(i) specifies midrail height and is the same requirement as in E § 1926.500(f)(1). Paragraphs (b)(2) (ii) and (iii) are new provisions that address the proper placement of screens, mesh, intermediate vertical members, and other structural members when they are used in lieu of midrails. Paragraph (b)(3) requires guardrail systems to be capable of withstanding the application of a 200 pound force applied within two inches of the top edge in an outward or downward direction. This is essentially the same requirement as E § 1926.500(f)(1)(vi)(b), except the existing phrase "with a minimum deflection" is changed to read in paragraph (b)(4)(i) that "when the 200 pound test load is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches above the walking/working surface." Deflection is specified for the top edge because that is the point an employee is most likely to fall against and it must be high enough, at all times, to prevent the employee from flipping over the system. Paragraph (b)(5) provides similar specifications for midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent structural members. No minimum deflection is specified as these are not the points where an employee is in danger of flipping over the protective barrier. Paragraph (b)(6) requires that guardrail systems be smooth surfaced to prevent employee injury due to lacerations or tripping caused by snagged clothing, and is based on E § 1926.500(f)(1)(vi)(c). Paragraph (b)(7) requires that toprails and midrails not be so long as to constitute a projection hazard, and is the same requirement as E § 1926.500(f)(1)(vi)(d).

Paragraph (b)(8) is a new requirement and prohibits the use of steel banding and plastic banding as toprails or midrails. While such banding can often withstand a 200 pound load, it can tear easily if twisted. In addition, such banding has sharp edges which can cut a hand if seized.

Paragraph (b)(9) requires all rails to be at least one-quarter inch in diameter or thickness. This is consistent with previous OSHA interpretations related to the use of wire cable as toprails and midrails. As guardrail strength is specified in paragraphs (b)(3), (4), and (5) above, the purpose of this requirement is to assure that rails made of high strength materials not be so thin that a worker grabbing a rail is injured because of the small size of the rail. This rule does not conflict with

E § 1926.750(b)(1)(iii) which requires wire

cables used as guardrails during steel erection to be at least one-half inch in diameter. The purpose of that provision is to assure that guardrails on erection or derrick floors are strong enough to withstand the impact loads which can be encountered during steel erection when the rails are struck by a load during hoisting operations.

Paragraphs (b)(10) through (15) are requirements for the use of guardrail systems. Paragraph (b)(10) sets forth the minimum length of guardrail required at hoisting areas during the performance of built-up roofing operations on low-pitched roofs. This is a combination of E § 1926.500 (g)(5)(i) and (ii).

Paragraph (b)(11) requires chains, gates, or guardrail sections to be placed across access openings when hoisting operations are not taking place. This is the same requirement as E § 1926.500(g)(5)(i), which is a clarification of the general rule E § 1926.500(d)(1). However, as written, the existing standard applies only to built-up roofing operations on low-pitched roofs. The proposed standard is written to apply clearly to all hoist locations.

Paragraph (b)(12) provides that when guardrails are used at holes, they be erected on all unprotected sides or edges of the hole. This is essentially the same requirement as in E § 1926.500(b)(1).

Paragraph (b)(13) provides that guardrails around holes used for material access not have more than two sides provided with removable guardrail sections, and that the guardrails be in place or the hole covered when the hole is not in use. This is essentially the same requirement as E § 1926.500(b)(3)(i), (b)(3)(ii), (b)(5), (b)(8), and (b)(8).

Paragraph (b)(14) provides that guardrails around holes used as points of access (such as ladderways) shall be provided with gates or be so offset that a person cannot walk directly into the hole. This is essentially the same requirement as E § 1926.500(b)(2). Paragraph (b)(15) sets forth the requirements for guardrails used on ramps and runways and is essentially the same requirement as E § 1926.500(d)(3).

The provisions in existing paragraphs E § 1926.500(f)(1) (i), (ii) and (iii) provide detailed specifications for minimum sizes of guardrail system components. However, OSHA believes that the important consideration in guardrail system design and construction is that the guardrail system be capable of supporting safely the loads as specified in paragraph § 1926.500(b), and not that

a guardrail system have a particular sized component or post spacing.

Consequently, the proposal would relocate the provisions of these existing paragraphs to Appendix A, and would not make them mandatory. The relocation of these provisions does not reduce the level of safety presently achieved by the existing standard. The existing specific provisions are engineered solutions to the requirements of E § 1926.500(f)(1)(vi) which are performance criteria essentially the same as the performance requirements being proposed. Relocating the provisions to Appendix A reduces redundant provisions and eliminates the possible misinterpretation that the specified provisions are the only acceptable ways of building guardrail systems.

Paragraph 1926.502(c) Safety net systems. This paragraph replaces existing section E § 1926.105—Safety nets. The subject matter is relocated to Subpart M because of its obvious relation to the revised fall protection scope of this Subpart. As discussed below, most of the proposed requirements are substantively the same as the existing provisions.

Paragraph (c)(1) requires safety nets to be installed as close as practicable under the walking/working surface where employees need to be protected, but in no case more than 25 feet below such level. This paragraph clarifies existing paragraph E § 1926.105(a) which implies that safety net systems are not required until the fall distance exceeds 25 feet. Proposed paragraphs E § 1926.501 (b) and (c) clearly require fall protection when the fall distance exceeds six feet (with some limited exceptions), not 25 feet. An exception, without limit, is made for bridge construction where only one level of nets is required. This exception is presently recognized by paragraph E § 1926.105(c)(2). However, public comment on the adequacy of this exception is requested in the Specific Issues section of this preamble.

Paragraph (c)(2) requires nets to extend outward at least 15 feet from the outermost projection of the work surface. This is a change from the existing eight foot requirement of paragraph E § 1926.105(c)(1). The National Bureau of Standards (NBS) has conducted tests to evaluate this requirement. Their findings indicate that at least 15 feet are required to fully contain a body falling 25 feet (Ex. 14.50).

Paragraph (c)(3) requires nets to be rigged with sufficient clearance under them to prevent contact with the lower level when the net is subjected to impact

forces as specified in paragraph (c)(4). This is substantively the same requirement as in E § 1926.105(c)(1).

Paragraph (c)(4) specifies the capacity requirements for safety nets and safety net installations. The paragraph requires employers to show that nets and net installations meet the capacity requirements by conducting drop tests meeting designated parameters, or by certification by a qualified person that the net and net installation meet all specified criteria when the employer can demonstrate that drop testing is not feasible or practicable. An example of where a drop test may not be feasible or practicable is where the net is strung over a public thoroughfare and the test could endanger people below. Another example is where the test weight cannot be readily retrieved from the net once it has been dropped.

For the purposes of paragraph (c)(4), OSHA considers two or more net panels joined together to be one net. Safety net installations which do not share the same net are considered to be separate systems. In addition, each time a safety net system is erected, it is considered to be a separate installation which must be tested or certified. This is a clarification of existing paragraph E § 1926.105(b) which requires all net installations to be drop-tested. Paragraph (c)(4)(ii) sets forth the proposed criteria for performing drop tests on net installations. In most respects, these criteria are the same as the paragraph 8 requirements of ANSI A10.11-1979. However, the proposal requires the test to be conducted from the highest walking/working surface on which employees are to be protected, as opposed to the 25-foot height required by ANSI, so that the test more closely resembles the type of fall from which the worker is to be protected. OSHA believes the use of a 400 pound weight to test the system is sufficient to ensure that a proper margin of safety is obtained.

Paragraph (c)(5) is a new provision and requires safety nets to be inspected weekly for mildew, wear, damage, or other deterioration. Defective components must be removed from service. Paragraph (c)(6) is also new and requires debris and tools to be removed as soon as possible from the net, but not later than the start of the next work shift. Such obstacles pose obvious safety hazards to anyone who falls into the net. Paragraph (c)(7) specifies the maximum allowable mesh opening and is essentially the same as existing rule E § 1926.105(d), which provides for a maximum of six inches on any side of an opening. The proposal also limits the

size of the opening to a maximum of 36 square inches. This limit is proposed because mesh openings can be manufactured with more than four 6-inch sides. A limit of 36 square inches is necessary to keep the open mesh from being so large that an employee's head could go into it during a fall, and possibly breaking the employee's neck. This is the same requirement as in paragraph 5.1 of the 1979 ANSI standard for nets (Ex. 4). Paragraph (c)(8) specifies a minimum breaking strength of 5,000 pounds for border ropes used for net webbing, and is the same requirement as E § 1926.105(d).

Paragraph (c)(9) requires connections between net panels to be as strong as integral components, and to be spaced not more than six inches apart. This is essentially the same requirement as E § 1926.105(f), except the six inch requirement is new and based on the 1979 ANSI requirement, paragraph 9.3. The existing E § 1926.105(d) requirement that all new nets must meet accepted performance standards of 17,500 foot-pounds minimum impact resistance, as determined and certified by the manufacturer, is proposed to be deleted. This requirement applies only to the net and not to the net installation. OSHA believes the important consideration is the safety net system as a whole, and that the provisions of proposed paragraph (c)(4) are sufficient to assure proper safety for employees. The best net can be rendered useless by an improper installation. For these same reasons, the E § 1926.105(d) requirement for a label of proof test also is proposed to be deleted. In addition, existing paragraph E § 1926.105(e) requiring forged steel safety hooks or shackles to fasten nets to supports is proposed to be deleted. The existing rule is unduly specific as there are other acceptable ways and means to fasten nets to supports, such as wire ropes.

Paragraph 1926.502(d) Body belt/harness systems. This paragraph replaces all of existing section E § 1926.104—Safety Belts, Lifelines, and Lanyards and would relocate coverage of bodybelt/harness systems to Subpart M as revised. This is done as part of the consolidation of fall protection requirements for construction.

Paragraph (d)(1) requires that body belt/harness systems only be used for employee protection and not as materials or equipment hoist slings, bundle ties, or for similar purposes. This is substantively the same requirement as E § 1926.104(a). Paragraph (d)(2) requires that body belt/harness systems or components subjected to impact loading, as distinguished from static load testing,

be removed from service, inspected, and not used for employee protection again until found suitable for such use. This is the same requirement as in

E § 1926.104(e) except the existing provision prohibits any further use of the belt for employee protection. However, OSHA recognizes that not every impact loading adversely affects a body belt/harness system. For example, a relatively short fall of one foot may leave the belt/harness system undamaged; however, a long fall of six feet probably will destroy the belt or harness. Because OSHA believes many factors, such as the employee's weight and the type of deceleration device used, will affect a system's potential capacity for reuse as employee protection, no blanket prohibition of reuse after any impact loading is proposed. Paragraph (d)(3) requires lifelines to be protected against being cut or abraded. This is essentially the same requirement as E § 1926.104(c) except the new provision deletes the specification for seven-eighth-inch wire core manila rope. This change is proposed due to the availability of other equally satisfactory types of rope which, when they are properly protected against wear, are adequate for use as lifelines. Paragraph (d)(4) requires body belt/harness systems to be rigged to minimize free fall distance with a maximum free fall distance allowed of six feet, and is meant to clarify existing rule E § 1926.104(d). The new provision also limits the drop distance by requiring the system to be rigged such that the employee cannot contact any lower level. OSHA believes that it is not sufficient to rig the system with a six foot lanyard where, for example, the potential fall distance is only eight feet. In such a situation, the lanyard would stop the free fall at six feet but the employee would bend at the waist (if a simple belt is worn). Thus, at the end of the free fall, the employee's arms, legs, and head would continue to "fall" a distance greater than the six feet and could strike the lower level. Also to be considered when body belt/harness systems are rigged is the type of deceleration device used and the additional fall distance required for it to stop the fall effectively. Based on recommendations made by the body belt/harness manufacturing industry, paragraph (d)(5) limits this additional fall distance for the deceleration device to stop the fall to 42 inches (excluding lifeline elongation). Paragraph (d)(6) is a new provision and limits the arresting force generated by a deceleration device to 10 times the employee's weight or 1,800 pounds, whichever is lower. The

"10 times" limit is based on the provisions in paragraph 3.3.5 of the American National Standard Institute's publication ANSI A10.14-1975.

"Requirements for Safety Belts, Harnesses, Lanyards, Lifelines, and Drop Lines for Construction and Industrial Use" (Ex. 5). OSHA believes this limit alone is not sufficient to protect an employee from serious harm as the arresting force generated is a function of the employee's weight. For example, a 180 pound employee would experience an 1,800 pound arresting force, while a 250 pound employee would experience a 2,500 pound arresting force. Consequently, a maximum force of 1,800 pounds is proposed to avoid excessive body stresses when a fall is arrested. For a further discussion of this limit, see Issue Number 8.

Paragraph (d)(7) is a new provision and requires body belt/harness attachment points to be behind the hip of the wearer, preferably in the middle of the back or above the head, in order to produce the least amount of strain on the body when the falls are stopped.

Paragraph (d)(8) requires body belts to be at least one and five-eighths inches wide. This is essentially the same requirement as the ANSI A10.14 requirement in paragraph 3.2.1, and is intended to distribute the arresting force over a large area of a body. Paragraph (d)(9) requires hardware to be drop forged, pressed, or formed steel, or equivalent strength material. This is essentially the same requirement as E § 1926.104(e), except the Federal Specification requirement is deleted as being unnecessarily restrictive as other suitable hardware is available.

Paragraph (d)(10) requires hardware to be corrosion-resistant and smooth-finished so as to not damage the attached belt or lanyard. This is essentially the same requirement contained in E § 1926.104(e). Paragraph (d)(11) would provide that only one employee may be attached to any one vertical lifeline. This is a clarification of E § 1926.104 (b), (d), and (f) which specify minimum requirements for body belt lifelines. These limits are only adequate for one employee per lifeline, and OSHA thereby does not allow more than one employee per lifeline. In addition to strength considerations, OSHA believes it is inherently unsafe for two workers performing separate tasks to use a single vertical lifeline. Movement by one employee could cause the lifeline to be pulled to one side which could, in turn, cause the other worker to lose balance. In addition,

should one employee fall, the other worker might be caused to fall also.

Paragraph (d)(12) would require body belt/harness systems to be secured to an anchorage capable of supporting twice the potential impact load of an employee's fall. This is a change from existing rule E § 1926.104(b) which requires anchorages to be capable of supporting a minimum dead weight of 5,400 pounds. This change is proposed because the existing rule is based on the rated strength of the manila rope commonly used for lifelines and lanyards at the time the rule was developed, and is not based on the actual load the anchor must support when an employee falls. The proposed rule is performance-oriented, and addresses the actual forces involved. A similar provision is set forth in Appendix D of OSHA's proposed rulemaking for powered platforms, 29 CFR 1910.66 (50 FR 2890, January 22, 1985), except that provision requires a design factor of only one for an anchorage's capacity. This proposal requires a design factor of two because of the public comments (Ex. 13) made in response to the powered platforms proposal.

Paragraphs (d) (13), (14), (15), and (16) specify minimum strength criteria for lifelines, lanyards, and other components, and require all components either to be capable of supporting a minimum fall impact load of 5,000 pounds or to have a minimum tensile strength of 5,000 pounds (except self-retracting lifelines and lanyards which have a 3,000 pound minimum limit). These requirements change the existing rules for lifelines and lanyards. E § 1926.104 (c) and (d), which specify a minimum limit of 5,400 pounds nominal breaking strength. This change is proposed because the existing rules were based on the strength of the then available manila rope used for body belt systems and not on the actual forces generated in a fall. The new requirement of 5,000 pounds fall impact load is based on a 250 pound employee experiencing a force of 10 times gravity times a safety factor of two. Paragraph (d)(16) requires hardware to be capable of supporting a minimum fall impact load of 5,000 pounds applied at the lanyard point of connection. This provision is consistent with the other proposed paragraphs and replaces existing rule E § 1926.104(f), which requires all hardware to be capable of withstanding a tensile loading of 4,000 pounds, but which does not specify where the 4,000 pound load is to be applied. The performance criteria of proposed rule (d)(12) for anchorages, and the specification

criteria of proposed rules (d) (13) through (16) for other body belt/harness components are consistent with the provisions set forth in Appendix D of OSHA's proposed rulemaking for powered platforms, and with rules being developed for other general industry (29 CFR Part 1910) application. Public comment is requested in Issue Number 22 on whether or not this approach is appropriate for the construction industry.

Paragraphs (d) (17), (18), and (19) are new provisions and regulate the use of snap hooks. These provisions are intended to reduce the danger of "roll out" by prohibiting the use of two or more snap hooks at the same point of connection. "Roll out" is the situation where snap hooks come in contact with each other, or some other object. In such a way that the hook opens and the belt or lanyard becomes disconnected.

Paragraph (d)(20) is a new provision and requires inspection of body belt/harness systems to insure that defective systems are not used.

Paragraph (d)(21) prohibits the attachment of body belt/harness systems to hoists or guardrail systems, and is the same requirement as E § 1926.500(g)(5)(iv), except the existing rule applies only to built-up roofing operations on low-pitched roofs, and does not include the guardrail restriction. The proposed rule would extend coverage to all hoist areas and guardrail systems. However, this is not a new rule as E § 1926.104(b) specifies minimum anchorage requirements for body belts. This rule is a clarification of how the existing requirement applies to two potential points of anchorage. OSHA believes that hoists and guardrail systems are not designed nor built to withstand the impact forces generated by a fall, and therefore, should be prohibited from being used as body belt/harness anchorages.

Paragraph (d)(22) specifies how body belt/harness systems are to be rigged when used at hoist areas and is the same as E § 1926.500(g)(5)(v), except the existing rule applies to only built-up roofing operations on low-pitched roofs. However, the requirement would be extended by the proposal to cover all hoist areas. The limitation on movement when wearing a body belt/harness is made because of the frequent tendency of employees to lean out over the edge at hoist areas.

Paragraph 1926.502(e) Positioning device systems.

These new provisions set the minimum performance criteria for "positioning devices," which are

systems similar to body belt systems and which can be comprised of many of the same components. The significant difference is that body belt systems are used to arrest falls, whereas positioning devices are used by employees to maintain a leaning position without using their hands while working on vertical surfaces. An example when these devices may be used is during the placement of reinforcing bars in the vertical face of a wall under construction. The employees often stand on bars already in place and must lean backward, similar to a lineman on a telephone pole, to place additional bars. The positioning device allows this to be done without the employees having to use their hands to maintain position. Paragraph (e)(1) limits the total fall distance of positioning devices to 24 inches. This distance is less than the six foot distance allowed for body belt/harness systems because the lanyards used with positioning devices usually do not stretch under fall impact loading and deceleration devices normally are not used to reduce the forces incurred during a fall. Paragraphs (e)(2) through (5) cover strength criteria and inspections. These provisions and their rationale are the same as those discussed above for body belt/harness systems.

Paragraph 1926.502(f) Warning line systems.

These provisions address proper warning line system construction, arrangement, set-up, maintenance, and use, and are the same requirements as E § 1926.500(g)(3) (i), (ii), and (iii). These provisions were discussed in detail in the preamble of the Notice of Final Standard Action for the Guarding of Low-Pitched-Roof-Perimeters During the Performance of Built-Up Roofing Work (45 FR 75818, November 14, 1980).

Paragraph 1926.502(g) Control zone systems.

These new provisions set minimum performance criteria for control zones used on leading edges and during overhand bricklaying operations. These systems are intended to serve as warning systems and as the designators and definers of areas where unique fall provisions apply. Paragraph (g)(1) requires control zones used on leading edges to be no closer than six feet to the leading edge, nor further than 25 feet away. The six foot limitation is needed to provide adequate warning to employees while their attention is diverted, that they are approaching a fall hazard. It warns workers that they are near an unprotected side or edge under construction. The 25 foot limit

requires the zone to be moved as construction of the edge progresses. Paragraph § 1926.501(b)(1) requires a guardrail system to be erected along the unprotected side edges (usually perpendicular to the leading edge) which result as the control zone is moved forward. Paragraph (g)(2) requires control zones used during overhand bricklaying operations to be not less than 10 feet nor more than 15 feet from the working edge where the overhand bricklaying operations are being performed. These limits were developed after extensive consultation with industry and union representatives and review by the ACCSH. The enclosed zone is intended to provide overhand bricklayers with an area free of interference from other employees not performing related work. Paragraph (g)(3) requires the zone lines and access path lines to be made of ropes, wires, tapes, or other equivalent materials and supported on stanchions. Paragraph (g)(3)(i) requires the system to be flagged or otherwise clearly marked. Paragraph (g)(3) (ii) and (iii) regulate the height of the control zone lines for leading edges and overhand bricklaying. Overhand bricklaying control zone height limits are higher than those for leading edge work to allow the ready passage of materials underneath the line. Paragraph (g)(3)(iv) requires a minimum line tensile strength of 200 pounds. This minimum strength is required to assure that the lines will not break if an inattentive worker walks into them. Paragraph (g)(4) requires control zones to be connected to points of access, materials handling areas, and storage areas by access paths made with control zone-type barriers.

Paragraph (g)(5) addresses those work situations where no guardrails have been erected prior to the beginning of overhand bricklaying or leading edge operations. The control zone limits the employees to a controlled area of work activity where overhand bricklaying or leading edge operations are being performed. In paragraph (g)(6), OSHA recognizes that erected guardrails can interfere with overhand bricklaying and leading edge operations, and allows guardrails to be removed to permit such work. However, guardrails may only be removed to the extent necessary to accomplish one day's amount of bricklaying or leading edge work. Once guardrails are removed the resulting unprotected edge must be guarded by a control zone. Paragraph (g)(7) allows only employees engaged in overhand bricklaying and related work to be in the control zone. This limitation is necessary because the presence of

extraneous employees in the control zone can interfere with otherwise safe work procedures used during overhand bricklaying and leading edge work.

Paragraph 1926.502(h) Safety monitoring systems.

The existing standard allows the use of safety monitoring systems as fall protection only on roofs and only during built-up roofing work. The proposed rule, however, allows such systems to be used also on walking/working surfaces other than roofs (see § 1926.501(b)(2)(i), leading edges). In addition, these systems are only defined in E § 1926.502(p)(7), and specific criteria are not set out in the body of the existing standard. The proposal sets forth specific criteria which apply when safety monitoring systems are used, as follows: paragraph (h)(1) requires safety monitors to be competent in recognizing fall hazards; to warn employees when they appear to be unaware of a fall hazard or are acting in an unsafe manner; to be on the same surface as the monitored employees and within visual sighting distance of them; and to be close enough to communicate orally with the employees. The monitor may have supervisory or non-supervisory responsibilities as there are no restrictions on the performance of other duties. However, the monitor must not be so busy with other responsibilities that the monitoring function is encumbered. Paragraph (h)(2) prohibits the use of mechanical equipment in areas where safety monitoring systems are being used to protect employees from falling. This is essentially the same requirement as in E § 1926.500(g)(4). Paragraph (h)(3) prohibits employees not engaged in built-up roofing work from being in an area where built-up roofing employees are working and protected by a safety monitoring system. This requirement is necessary because the presence of extraneous employees in these areas can interfere with otherwise safe work procedures used during built-up roofing work.

Paragraph 1926.502(i) Covers.

This paragraph, which is substantively the same as E § 1926.500(f)(5), sets the performance criteria for covers used to protect employees from falling into or through holes in floors, roofs, and other walking/working surfaces. Paragraph (i)(1) specifies the minimum strength requirements for covers used in roadways and vehicular aisles. Paragraph (i)(2) specifies the minimum strength requirements for all other covers. Whereas the existing rule, E

§ 1926.500(f)(5)(ii), requires all other covers to be capable of supporting the maximum intended load, the proposed rule specifies a minimum capacity of 250 pounds. This minimum capacity is based on what OSHA considers to be the average maximum weight of an employee and the employee's tools. Paragraph (j)(3) requires covers to be installed so as to prevent accidental displacement.

Paragraph 1926.502(j) Protection from falling objects.

This paragraph sets forth the performance criteria for providing protection from falling objects. Paragraph (j)(1) requires toeboards, when used, to be erected along the edge of overhead walking/working surfaces for a distance sufficient to protect employees working below. This is a change from existing rules E § 1926.500(b) (1), (2), (3)(ii), and (8) which require toeboards around floor, roof, and platform holes and openings regardless of whether or not employees are working below. However, the proposed rule is consistent with the intent of E § 1926.500(d)(1) and proposed paragraph § 1926.501(e) which require protection only where employees below are exposed to the hazard of falling objects. Paragraph (j)(2) would be a new requirement and specifies the minimum strength of toeboards. Paragraph (j)(3) specifies how toeboards are to be installed and is essentially the same as E § 1926.500(f)(3)(i). Paragraph (j)(4) provides that where tools, equipment, or materials are higher than the top of a toeboard, additional protection must be used, such as paneling or screening erected from the working level or toeboard to the top of the top rail or midrail. This requirement is substantively the same as E § 1926.500(f)(3)(ii). Paragraph (j)(5) requires that when guardrails are used to prevent objects from falling, the openings in the guardrail must be small enough to retain the potential falling objects. This is essentially the same requirement as E § 1926.500(c)(1)(ii) and (f)(7)(ii) except the specific limitations on hole size are deleted. Paragraph (j)(6) contains housekeeping provisions for overhead bricklaying operations which are intended to prevent tripping and to prevent displacement of materials and equipment to areas below the walking/working surface. Paragraph (j)(7) sets forth provisions for materials and equipment storage during built-up roofing operations. These are essentially the same requirements as E § 1926.500(g)(5) (vi) and (vii). Public comment is specifically requested in Issue Number 5 on what provisions are

appropriate for specifying proper canopy protection.

Section 1926.503 Training.

The requirements of this section are in addition to the training requirements of E § 1926.21, however, the provisions may be cited only when one or more citations are issued under the other provisions of Subpart M.

Paragraph (a)(1) clarifies the types of hazards to be addressed in all training programs given to educate employees using fall protection systems. Fall protection and fall protection systems are only effective when they are properly designed, built, located, maintained, and used. This section sets forth the purpose and general outlines for the requisite training. However, this section does not specify the details of the training program. Instead, it requires employees to be instructed in the proper way to erect, use, place, and maintain fall protection systems. In this way, the section provides flexibility for the employer in designing the training program.

Paragraph (a)(2) specifies that training and retraining be provided for each employee as necessary. OSHA requests comments on whether or not a more specific requirement would be appropriate in Issue Number 3.

Appendix A to Subpart M—Guardrail Systems. As explained in the discussion for the proposed section governing guardrail systems, this appendix is a non-mandatory set of guidelines provided to assist employers in complying with the requirements of paragraphs § 1926.502(b) (3), (4) and (5). If a contractor uses these guidelines to select guardrail system components, and builds the system as indicated by the guidelines, then OSHA will assume that the components meet the requirements of paragraphs § 1926.502(b) (3), (4) and (5). Components for which no specific guidelines are given in the appendix (e.g., joints, base connections) must be designed and constructed in accordance with the capacity requirements of paragraphs § 1926.520(b) (3), (4) and (5). The appendix neither creates additional obligations nor eliminates obligations otherwise contained in the standard. It is intended to provide useful, explanatory material and information to employers and employees who wish to use it to aid in understanding and complying with the standard.

Appendix B to Subpart M—Roof Widths. Appendix B is provided to serve as a guide to assist employers in complying with the requirements of paragraph § 1926.502(f). The record compiled for the promulgation of existing subsection E § 1926.500(g),

which requires the guarding of low-pitched roofs during the performance of built-up roofing work, demonstrates that there was confusion as to which dimension of a building should be considered to be the width of a roof. Appendix B explains that in all cases the building must be viewed in plan view (i.e., viewed from above, looking down). The width of the roof is then the narrower of the two primary dimensions which define the roof area. Although the Appendix does not show all possible roof configurations, it does give some common arrangements. This appendix neither creates additional obligations nor eliminates obligations otherwise contained in the final standard. It is intended to provide useful, explanatory material and information to employers and employees to aid in understanding and complying with the standard.

Appendix C to Subpart M—Test Procedures for Evaluating Body Belt/Harness Systems and Positioning Device Systems. Appendix C is provided to serve as a guide to assist employers in complying with the requirements of paragraphs § 1926.502 (d) and (e). Body belt/harness and positioning device systems which have been tested in accordance with the criteria of this appendix will be deemed by OSHA to meet the performance criteria of paragraphs § 1926.502(d) (5), (6), (15), and § 1926.502(e) (3) and (4). This appendix neither creates additional obligations nor eliminates obligations otherwise contained in the standard. It is intended to provide useful, explanatory material and information to employers and employees to aid in understanding and complying with the standard.

Specific issues. The public is specifically requested to comment on the following issues:

1. The preamble identifies the provisions in the standard which are new or which are changed from the provisions of the existing standard. OSHA believes that many employers are already following many of these revised provisions. However, OSHA will evaluate, on the basis of all the evidence submitted to the public record, the likely effectiveness of the proposed revised and new provisions and will include in the final rule only those revised and new requirements for which a significant reduction in the risk of incurring injuries or fatalities would be supported by the final record. Hence, the following issues are raised:

- a. Public comment is requested on the current level of practice which meets the requirements of the proposed changes:

b. Public comment is requested on the practicality and feasibility of the proposed changes, and whether implementation of the proposed changes will reduce the occurrence or severity of accidents;

c. Public comment is requested on the amount of any costs or savings which have not been identified by OSHA (see Section IV of this preamble—Preliminary Regulatory Impact Assessment and Regulatory Flexibility Analysis) which might result from the proposed changes;

d. Public comment is requested on the availability and content of accident reports which indicate that the proposal does not properly address fall hazards.

2. Are there areas or operations, in addition to those already identified in proposed § 1926.501, which have unique fall protection requirements not addressed by the proposed standards? Examples of such areas and operations might include carpenters erecting roof trusses during house construction; steel erectors working on other than tiered buildings (which are covered by Subpart R—Steel Erection) such as single story buildings, high bay buildings, warehouses, prefabricated buildings, communications towers, storage tanks, bridges, antennas, industrial plants, and similar structures; or connectors erecting wood, precast concrete, and structural members made of other materials. Comments on this point should describe such areas and operations in detail, and should discuss the fall protection system which should be used.

In addition, public comment is requested on whether or not OSHA has been overly restrictive in its fall protection provisions by requiring the use of only certain types of protective systems in specified areas or for specified operations. For example, paragraph § 1926.501(b)(4) requires the use of covers or guardrail systems to protect against employees falling into holes located in the walking/working surface. Are there other systems, such as warning lines or attendants (such as those allowed in § 1910.23), which would provide adequate fall protection at such locations? If so, what other systems are appropriate, under what circumstances, and at what locations?

3. In some of the existing provisions and in some of the proposed provisions, OSHA uses specific numerical limits to define and clarify the duties set forth. For example, E § 1926.502(a) and proposed paragraph § 1926.500(b) define the term *bole* by giving a physical measurement. This then determines when certain safety systems must be used to protect against fall hazards. These and other limits are based on

existing laws and consensus standards, and are used in lieu of more performance-oriented language such as "covers shall be used on all holes which are large enough to constitute a fall hazard," or language which requires a numerical limit but then allows other configurations which give "equivalent" protection. OSHA believes that although such performance-oriented language would be less restrictive on employers, and thus give them more options when abating a hazard, it does not always tell the employer exactly what is required (i.e., how to do something "right"). On the other hand, requiring specific numerical limits in the rule and allowing the employer to use other limits which the employer can show will provide "equivalent" protection may respond to both these concerns. OSHA believes that the use of specific limits in certain provisions (such as those listed above) provides the required notice to employers as to how they can comply with a provision compared to how OSHA intends to enforce the provision. OSHA believes that such notice serves to inform employers and employees about the proper way to do things; promotes consistency in hazard abatement at all worksites; and also minimizes legal disputes over the intent of a requirement. On the other hand, specification language can increase costs without increasing safety, discourage technical innovation, prevent the use of safe alternatives, and fail to anticipate the varying needs and situations in the numerous workplaces covered by the standard.

Public comment is requested on whether or not OSHA's use of specification language is appropriate, or if it should be moved to a non-mandatory appendix which could provide guidance to employers. If not, how should the provisions be written to provide the desired flexibility and the required fair notice? If the continued use of such limits is appropriate, are the proposed limits sufficient to abate the hazards? Comments should include appropriate cost and injury data.

4. Existing provision E § 1926.500(d)(1) and proposed provision § 1926.501(b) require fall protection systems to be erected or used at all unprotected sides and edges of floors (open-sided floors) and similar walking-working surfaces. As worded, the existing provision has been interpreted to mean that a guardrail is required around an open-sided floor even when employees on the floor are working near the middle of the floor and are removed from the perimeter fall hazard. The proposed language could also be interpreted to require the same degree of protection.

The existing provision has also been interpreted to mean that a citation for lack of fall protection should be issued only when employees are working near the unprotected side or edge and are thus exposed to the fall hazard. Public comment is requested on whether or not a distance (or some other method of defining exposure) should be specified whereby fall protection would be required only when an employee is within that distance of a fall hazard. Proponents for such a limit should state what that distance should be, and why. Proponents for the existing language, as modified in the proposal, should state why a limit would not be appropriate. All comments should include appropriate cost and injury data.

5. Proposed § 1926.503(a)(2) would require training and retraining as necessary for all employees exposed to fall hazards. Public comment is requested on whether a more specific requirement or a less specific requirement such as that found in § 1926.21, would be appropriate. OSHA intends to include in the final rule only those training requirements for which a significant reduction in the risk of incurring injuries or fatalities would be supported in the final record.

Public comment is also requested on what training programs are currently available, who is providing them, and their cost. To the extent possible, examples of both adequate and inadequate training programs should be provided, with examples of how inadequate training may have contributed to unsafe conditions.

Companies, unions, trade associations, and other organizations conducting training programs also are encouraged to submit data concerning the safety records of employees who have undergone training. For example, have companies which have instituted training programs experienced a decrease in accidents compared to the situation existing before training was started?

Information concerning the costs of training and how such costs may be offset by more efficient and/or safe operations is also requested. Although OSHA believes safety training is necessary and beneficial, comments have been received that raise the following concerns:

What level of specificity should OSHA require in a training program? What are the necessary elements of a training program? Can the more general training requirements contained in § 1926.21 be effective in providing employees with adequate training or are

the more specific requirements in this proposal necessary?

Do employers or employees believe that training is too costly for the benefits it yields? If OSHA should not require training at all, is there a basis for predicting if training efforts will decrease, increase, or stay at present levels? Would employers, employees, or other interested parties support the omission of the training requirement proposed for this subpart? Do data, eyewitness, and anecdotal evidence exist which may constitute support for OSHA's not requiring training?

Comments are also requested on whether or not training should be required to be included in specific sessions devoted to an overall view of safety issues likely to be encountered, or are on-the-job sessions, limited to isolated safety concerns as they are encountered, sufficient to insure safety?

In addition, OSHA requests comments on whether compliance with these proposed training requirements could be practicably accomplished without keeping records. Do these proposed training requirements, as written, impose an implicit recordkeeping burden on employers? Data on the cost and time necessary for keeping training records, if any, are requested.

6. Should OSHA promulgate rules requiring the inspection of work surfaces to determine their structural integrity prior to employees being required to work on such surfaces? Currently, there are no specific requirements that address this concern. The purpose of these inspections would be to insure that work surfaces have the requisite strength to not collapse under the weight of employees, tools, and materials. That such a rule may be needed is evidenced by a study conducted by OSHA (Ex. 3.77). That study shows that of eight fatalities of employees falling through ceilings, four of the accidents were caused by the work surface not being capable of supporting the employee's weight. The study also shows that of 55 fatalities resulting from falls from roof levels, approximately eight were caused by the employees working on surfaces with insufficient structural strength to support their weight. Comments should address the types of inspection criteria necessary, the methods to be used, and the qualifications of the inspectors.

7. Should OSHA promulgate a rule requiring covers to be painted or otherwise clearly marked to indicate their function as a cover? Covers are often only pieces of plywood and the purpose of this rule would be to help employees distinguish between a covered hole and debris.

8. Paragraph § 1926.501(e) allows protective canopies to be erected as an alternative form of falling object protection. Comments are requested on what criteria should be specified in paragraph § 1926.502(j) to assure proper protection for employees.

9. Proposed paragraph § 1926.252(c)(5) requires safety nets to be inspected weekly, and proposed paragraphs § 1926.252 (d)(20) and (e)(5) require body belt/harnesses and positioning devices to be inspected prior to each use. Public comment is requested on this degree of frequency of inspection.

10. The term "mechanical equipment" is used to describe the type of equipment addressed in the provisions of proposed paragraph § 1926.502(f) which addresses built-up roofing work. Wheelbarrows and mopcars are exempted from the provisions of § 1926.502(f) because, as discussed in the 1980 rulemaking package E § 1926.502(g) Guarding of low-pitched roof perimeters during the performance of built-up roofing work (45 FR 222).

(f) These two pieces of equipment are excluded from the definition because their use does not require employees to move backward. In addition, they are light in weight and, therefore, develop little momentum. Wheelbarrows and mopcars do not present the same degree of risk to roofing employees as do machines such as felt layers and gravelbuggies. Mopcars and wheelbarrows do not require employees to divide their attention between the equipment they are using and the roof edge, as they would have to do with heavier, more awkward machinery. In addition, excluding mopcars and wheelbarrows from outside the warning line would require employees to transport hot tar, gravel, and related materials by hand. This could result in increased burn injuries and employee fatigue, both of which may be very hazardous when working near the roof edge.

Public comment is requested as to whether or not mopcars and wheelbarrows should remain the only exempted pieces of equipment.

11. Paragraph § 1926.501(b)(10) would provide that fall protection not be required during the performance of built-up roofing operations on low-pitched roofs when the fall distance is less than 16 feet. As discussed in the preamble, this exemption was reviewed by various labor and industry groups during a 1980 rulemaking. OSHA believes the 16-foot exemption is not necessary and that a six-foot limit is both more appropriate and more consistent with other Subpart M provisions. Although this would appear to increase the requirements, OSHA believes this provision can be changed without significant impact because another part of the existing and proposed rule states that guardrails,

body belts, safety nets, and warning lines are not required on roofs 50 feet or less in width. OSHA believes the 50-foot limit has the same exemptive effect as the 16-foot limit, except safety monitoring would be required in more situations. Public comment on this change should include appropriate cost and injury data.

12. Paragraphs § 1926.501 (b)(7) and (e) set forth alternative systems and procedures for preventing employees from falling into obscured excavations, and from walking into areas where falling object projection is required. Public comment is requested on whether or not signs should be listed as an alternative method of providing the required protection. Whereas the other forms of protection involve either removing the hazard or physically restraining the employee, signs are passive and can be missed if an employee's attention is on other matters. However, signs can provide valuable information about the nature of the hazard present, and can be less costly to erect. Comments should include appropriate cost and injury data.

13. Proposed § 1926.501(b)(1) requires the use of body belts, safety nets, or guardrail systems on surfaces more than six feet above lower levels. During bridge construction, safety nets are commonly selected to provide the required fall protection. Proposed § 1926.502(c)(1) requires only one level of net when bridges are being built, the same as existing rule E § 1926.105(c)(2). Public comment is requested on whether or not a single net provides adequate fall protection for bridge projects where employees working on the upper levels of the bridge could fall and strike bridge structural members before they fall into the safety net. Stated another way, should body belt systems be required on bridge construction, in addition to nets, where the employees do not have an unobstructed fall to the net?

14. OSHA is proposing to require body belt/harness systems to be rigged such that they minimize the amount of free fall with a maximum free fall distance allowed of six feet (1.8 m). In addition, the maximum allowable force produced is limited to 10 g, or 1,800 pounds (8 kN), whichever is lower. These provisions are consistent with ANSI A10.14-1975 and a National Bureau of Standards report on fall safety equipment (Ex. 6). However, there are several authorities which would further restrict or even prevent the use of body belt/harnesses in fall arrest systems. For example, the draft ISO international standard for personal fall arrest systems sets limits on the arresting force permitted when

using a body belt to five kN (1.125 pounds) (Ex. 9). This draft ISO standard also prohibits the use of a system which would suspend a worker more than 50 degrees from a vertical position after a fall is arrested. OSHA believes that the ISO requirements would effectively eliminate the use of body belts in fall arrest systems.

Another study conducted by Dr. Maurice Amphoux, et al. (Ex. 10), recommends that body belts not be used as fall arrest systems because of injury potential. A British Standard (Ex. 11) limits the use of body belts to a maximum free fall of two feet (0.6 m) and a maximum force of five g_s . In addition, a recent review by the U.S. Air Force Aerospace Medical Research Laboratory of pertinent literature on personal fall arrest systems (Ex. 12) concludes that a body belt is not safe for prolonged suspension (especially motionless suspension).

In addition, comments and testimony received on the OSHA Subpart F powered platform proposal (29 CFR 1910.66 [50 FR 2890], January 22, 1985) relative to personal fall arrest systems stated that injuries were sustained by employees who used a body belt during fall arrest, and recommendations to limit the use of, or ban use of, the body belt for personal fall arrest systems were made.

In view of this additional information, OSHA requests that interested parties provide information, comment and supportive data as to the use of a body belt in a fall arrest system. Specifically:

- a. Should OSHA restrict the use of body belts as personal fall arrest systems? If so, should limitations be placed on body belt usage?
- b. Is the maximum six foot (1.8 m) free fall limitation acceptable for body belts? Should a two foot (0.6 m) or other limitation be adopted for body belts instead?
- c. Is the proposed 10 g_s or 1,800 pound (8 kN) force limitation for body belts acceptable? Is it acceptable for body harnesses?
- d. Is there additional information available which indicates that prolonged suspension in a body belt may be a problem?
- e. Is injury data available which shows that employees have been injured by a body belt during fall arrest, or during suspension following fall arrest?
- f. If body belts are not allowed in personal fall arrest systems, or if limitations are placed on their use so that body harnesses are more widely used, what are the costs and benefits of using body harnesses, rather than body belts? What is the availability and

worker acceptance of body harnesses in industry?

15. OSHA requests comments concerning the best method for stating the maximum force limitation allowed for body belt/harness systems. By using the force generated by a 10 g_s deceleration alone as the limitation, the permitted force value will vary with the weight of the worker. For instance, based on a 10 g_s limitation, a 275 pound (125 kg) worker would be permitted by the standard to experience 2,750 pounds (12.3 kN) of force during an arrest. In view of the human tolerance information discussed above, OSHA believes that this amount of force is unacceptable, and has proposed 1,800 pounds (8 kN) as the maximum force limitation. OSHA requests comments on the following points:

- a. Does the proposal provide a reasonable means of taking both deceleration and force into account? Should the limitation be expressed solely as either maximum arrest force (pounds force), or the force generated by a maximum arrest deceleration (i.e., g_s)?
- b. Is the 1,800 pound (8 kN) limitation acceptable? If not, what should the limit be? What information is available to support a different limitation for arresting force?
- c. The suggested test procedures in Appendix C include a 130 pound (59 kg) test weight for lanyard systems. The National Bureau of Standards' report (Ex. 8) identified the use of lighter test weights as being more important in meeting the 10 g_s limitation for lanyards than for heavier test weights, because lighter test weights do not cause lanyards to be as elastic as do heavier weights. However, if the standard were to impose only a force limitation on fall arrest systems, a 130 pound (59 kg) test weight would not reflect the forces to which employees over 130 pounds (59 kg) would be exposed during a fall. OSHA requests data, views, and arguments on whether the 130 pound (59 kg) test weight for lanyard systems is appropriate, or whether the 220 pound (100 kg) test weight, which is used for all other systems, should also be used for lanyards during the force test?
- d. Comments and testimony received on the OSHA Subpart F powered platform proposal relative to personal fall arrest systems stated that the test procedures proposed were confusing and overly complicated, and simplified test procedures were recommended. Are the test procedures in this proposal too complex? If the strength of all of the components of a personal fall arrest system are specified, would a single qualification test to measure arresting force be sufficient? What should be the

parameters of a single test (such as free fall distance, test weight, arresting force limit)?

16. OSHA has received a number of conflicting views on body belt/harness system snap-hook design. During meetings with the Fall Protection Group of ISEA, several members of that group suggested that single action snap-hooks should no longer be permitted and favored a requirement which would mandate the use of locking snap-hooks. Other members expressed the viewpoint that properly designed and properly applied single action snap-hooks are acceptable, and that their continued use should be allowed. Comments and testimony received on OSHA's Subpart F powered platform proposal relative to personal fall arrest systems recommended the use of locking snap-hooks. OSHA requests suggestions, information, and supporting rationale as to the type of snap-hook which should be permitted. In addition, OSHA requests information pertaining to:

- a. The number of snap-hooks (single action versus locking) in use;
 - b. The increased cost of using locking snap-hooks rather than single action snap-hooks; and
 - c. Incidents in which either single action or locking snap-hooks have failed in use.
17. Paragraphs §§ 1926.502 (d)(20) and (e)(5) require body belt/harness systems and positioning device systems to be inspected prior to each use for mildew, wear, damage, and other deterioration. Public comment is requested on whether or not more definitive inspection criteria is needed for determining when such systems are no longer suitable for use. If so, what criteria should be specified?
18. Public comment is requested on the following issues relating to the testing procedures set forth in Appendix C: What tests are manufacturers of body belt/harness and positioning device systems using to evaluate their equipment? Are these tests similar to the ones included in this proposal? Are products labeled as meeting a test standard, or the tests proposed by OSHA? What information is currently available to employers regarding testing of existing personal fall protection equipment? Can the proposed test methods be simplified? If so, how? Should qualification testing of personal fall protection systems be mandatory?
19. Both this proposal and Appendix D of OSHA's proposed rulemaking for powered platforms require body belt/harness systems to have certain specified strength characteristics. Non-mandatory test procedures are given (see Appendix C of this subpart) to

assist employers in complying with the strength requirements. Body belt/harness systems tested by manufacturers in conformance with the guidelines given in the Appendix C would be considered as acceptable systems and components that meet the requirements of § 1926.502(d). Other test procedures which evaluate system strengths would also be acceptable. A commenter on Appendix D has criticized the test methods section as inadequate and suggested that testing be done in accordance with test methods of approved consensus standards for components and subassemblies of systems rather than for a complete system as OSHA has proposed. In addition, this commenter believes that tests should be mandatory. OSHA requests comments and suggestions regarding the need for clarified, mandatory test methods for components and subassemblies of body belt/harness systems and positioning device systems. OSHA would be particularly interested in any information about the existence, or development, of national consensus standards for the design and testing of such systems, components, and subassemblies.

20. A commenter on OSHA's Subpart F powered platform proposal has criticized the mandatory provisions of the powered platform proposal for failing to spell out how equipment components should be connected, and the circumstances in which the components and subsystems of a body belt/harness system would be interchangeable. It has, for example, been suggested that OSHA require body belt/harness equipment manufacturers to label their products indicating when employers could use them interchangeably and with what other equipment. It was also suggested that the components and subsystems, and any combinations thereof that an employer might employ, be tested to meet static and dynamic strength requirements. OSHA solicits comments and suggestions regarding the range of components and subsystems reasonably available to system designers and users, the availability of any nationally or internationally recognized test methods for components and subsystems, and information regarding components and subsystems which are not interchangeable. In addition, OSHA requests public comment on whether or not interchangeability would be useful or feasible.

21. OSHA uses the term "deceleration device" in both this proposal and in OSHA's Subpart F powered platform proposal to describe certain fall arrest

components. A Subpart F commenter has suggested that "deceleration device" is not properly descriptive and that OSHA should instead, utilize the terms "fall arrester," "energy absorber" and "self-retracting lifeline/lanyard" to cover the separate components and subsystems involved. OSHA solicits comments as to how adequately the term "deceleration device" encompasses the components and subsystems which are used to control deceleration. OSHA also requests comments regarding the suggestion that "deceleration device" be replaced by more specific terms.

22. Proposed paragraph § 1926.502(d)(10) would require all body belt/harness hardware to "have a corrosion-resistant finish," the same as required by Appendix D of OSHA's Subpart F powered platform standard. A Subpart F commenter has suggested that OSHA quantify the corrosion resistance requirements, referring to the ASTM Salt Spray Testing Standard. OSHA solicits comments and suggestions regarding the utility and feasibility of quantification. Suggestions should be accompanied by supporting information.

23. Paragraph § 1926.502(d)(13) and OSHA's Subpart F powered platform proposal would require certain specified self-retracting lifelines and lanyards to have a minimum tensile strength of 3,000 pounds. A Subpart F commenter has suggested that self-retracting lifelines and lanyards be required to meet this minimum load requirement with the lanyard or lifeline fully extended. It was also suggested that OSHA specify the maximum arresting force to be transmitted by those devices taking into account the kind of "body belt or harness" used. OSHA solicits comments and suggestions regarding the proposed requirements for self-retracting lifelines and lanyards. Please submit supporting information.

24. A commenter on OSHA's Subpart F powered platform proposal has suggested that OSHA require proof-testing of dee-rings and snap-hooks at 100 percent of rated load to ensure that defective equipment is not used. OSHA solicits comments regarding the need for such testing and suggestions for possible implementation. OSHA would be particularly interested in information concerning what testing is currently performed or feasible, the cost of testing, and any accidents involving defects in such equipment.

25. A commenter on OSHA's Subpart F powered platform proposal has suggested that OSHA require that horizontal lifeline subsystems (trolley lines) be designed by "qualified persons" and that the requirements for

horizontal lifelines (see paragraph § 1926.502(d)(14) of this proposal) be revised to include more detailed guidance. OSHA solicits comments and suggestions regarding these recommendations. Please submit supporting information.

26. Paragraph § 1926.502(d)(12) would require body belt/harness anchorage to be capable of supporting at least twice the potential impact load of an employee's fall, and paragraphs § § 1926.502(d)(13) through (16) would require all other components to be capable of supporting at least 5,000 pounds. These provisions are consistent with the provisions set forth in Appendix D of OSHA's Subpart F powered platform proposal, and with rules being developed for other general industry applications. Public comment is requested on the applicability of this approach for the construction industry.

27. Subpart V—Power Transmission and Distribution provides additional criteria for personal climbing equipment, lineman's body belts, safety straps and lanyards. Paragraph § 1926.951(b)(4) requires lanyards and lifelines to meet the requirements of E § 1926.104. Safety belts, lifelines, and lanyards. Public comment is requested on the economic impact, and any other impact, that would result if the reference to paragraph § 1926.104 is changed to § 1926.502(d)—body belt systems, and § 1926.502(e)—positioning device systems.

IV. Preliminary Regulatory Impact Assessment and Regulatory Flexibility Analysis

Introduction and summary In accordance with Executive Order No. 12291 (46 FR 13193, February 17, 1981) OSHA has analyzed the economic impact of this proposed standard. Under the criteria established in E.O. 12291, OSHA has determined that the promulgation of this proposed standard would be a "minor" action because the expected costs of full compliance with the proposed standard would be approximately \$68.469 million less in the first year and \$27.482 million less each year thereafter than full compliance with the existing standard.

Affected industries and population at risk. The entire construction industry would be affected by the proposed changes to the existing Subpart M. In terms of the two-digit Standard Industrial Classification (SIC) codes, OSHA has determined that the proposal could potentially affect all firms in SICs 15, Building Construction—General Contractors and Operative Builders; SIC 16, Construction Other Than Building

Construction—General Contractors; and SIC 17, Construction—Special Trades Contractors. The majority of business firms classified under SIC 17 are subcontractors to the general contractors classified under SICs 15 and 16. Rather than classifying these sectors by their two-digit SIC designations, OSHA has used the type of finished construction product as the basis for classifying the construction industry into the following four general sectors:

1. Single-family housing,
2. Residential, except single family housing (e.g., hotels, apartments),
3. Nonresidential (e.g., commercial and institutional buildings), and,
4. Heavy Construction (e.g., bridges, utilities). In 1977, there were approximately 456,000 individual contractors affected by Subpart M.

OSHA has estimated that all of the approximately 4 million construction workers are exposed to fall hazards. Although it is quite likely that employee exposure to fall hazards would differ among the various construction trades, no data were available to quantify these differences.

Significance of risk. OSHA has estimated that the percentage of all occupational injuries that are injuries in construction due to falls from elevations is between 0.35 percent and 0.69 percent, with a mean of 0.52 percent. Applying this range to the 5,956,000 occupational injuries reported in the 1979 Occupational Injuries and Illnesses report (Ex. 6), OSHA estimated that the number of injuries in construction due to falls from elevations was between 20,845 and 41,095 with a mean of 30,970. Of these injuries, between 9,465 and 18,655, were lost workday injuries and between 11,380 and 22,440 with a mean of 16,910 were non-lost workday injuries. OSHA also estimated that the number of lost workdays in construction due to falls from elevations would be between 170,370 and 335,790, with a mean of 253,080.

In addition, OSHA determined that there would be between 45 and 60 yearly fatalities in construction associated with falls from elevations.

Consequently, OSHA concluded that the construction injuries and fatalities due to falls from elevations are significant and merit effort to reduce their numbers.

Feasibility, benefits, and cost. OSHA has determined that the proposed revision of Subpart M would be technologically feasible because it would permit the use of readily available technology and equipment.

Benefits from the proposal would accrue to all construction workers. OSHA has also determined that full

compliance with the proposed standard would prevent from 37 to 50 fatalities, from 17,300 to 34,110 injuries (from 7,855 to 15,485 of which would have been lost workday injuries and 9,445 to 18,825 would have been non-lost workday injuries), and from 141,390 to 278,730 lost workdays. OSHA has also determined that full compliance with the existing standard would prevent from 33 to 44 fatalities, from 14,385 to 28,355 injuries, (from 6,530 to 12,870 of which would have been lost workday injuries and from 7,855 to 15,485 would have been non-lost workday injuries), and from 117,540 to 231,860 lost workdays. Under conditions of full compliance, therefore, the proposed standard would prevent from 4 to 6 more fatalities, from 2,915 to 5,755 more injuries (from 1,325 to 2,815 lost workday injuries and from 1,590 to 3,140 non-lost workday injuries), and from 23,850 to 47,070 fewer lost workdays than would be prevented by the existing Subpart M.

OSHA does not endorse any particular estimate for the value of an employee's life. For illustrative purposes, however, OSHA used two methods to estimate the monetizable value of the benefits that would be a result of the implementation of the proposed standard. The first method, known as the "human capital" approach, directly estimates the foregone earnings and medical costs associated with an occupational injury or death. Lost production and medical costs to society, however, are the minimum benefits resulting from the prevention of an occupational injury. The other method of estimating benefits is based on the willingness-to-pay concept. Willingness-to-pay is the theoretical amount that the beneficiaries of a program would be willing to pay in order to obtain the benefits of the program or, in an occupational safety context, what a group of workers would pay to reduce the probability of a death or injury. Willingness-to-pay is therefore a more accurate indicator of the true social benefits of preventing injuries to workers.

Using the "human capital" approach, OSHA determined that the annual monetizable benefits would be from \$13,958 million to \$28,598 million greater from full compliance with the proposed standard than from full compliance with the existing standard. In present value terms (using a 10 percent discount rate), these potential increases in monetizable benefits would be between \$100,204 million and \$190,974 million over a 10-year period.

On the basis of the willingness-to-pay concept, OSHA determined that the annual monetizable benefits would be

from \$54,258 million to \$100,455 million (using \$3.5 million as the value for a prevented fatality) greater from full compliance with the proposed standard than from full compliance with the existing standard. In present value terms, these potential increases in monetizable benefits would be between \$390 million and \$721 million over a 10-year period.

Using the baseline of existing industry practice, OSHA estimated the costs of full compliance with the proposed standard to be \$76,310 million in the first year and the annualized costs to be \$65,777 million. The present value of these costs over the next 10 years would be \$508,445 million. OSHA also estimated that the costs of full compliance with the existing standard to be \$144,979 million in the first year and the annualized costs to be \$93,259 million. The present value of these costs over the next 10 years would be \$711,566 million.

Thus, OSHA determined that the net first-year cost savings in going from full compliance with the existing Subpart M to the revised Subpart M would be \$88,679 million. The annual cost savings thereafter would be \$27,472 million. The present value of these annual cost savings over the next 10 years would be \$203,115 million.

Consequently, OSHA concluded that full compliance with the proposed Subpart M would provide a safer environment at a lesser cost to the industry than would full compliance with the existing Subpart M and that the proposal is therefore the more cost-effective method of assuring the safety of employees working near fall hazards.

Cost of compliance for all other proposed OSHA construction safety standards. OSHA considered the economic impact on the construction industry of this proposed revision and of the seven other construction standards that have been recently revised and promulgated or that are in the proposed or final rulemaking stage. Using the baseline of current industry practice, OSHA estimated that the annual total costs of these standards would be about \$3.4 million for Underground Construction (Subpart S), \$5.8 million for Crane- or Derrick-Suspended Personnel Platforms (Subpart N), \$2.7 million for Concrete and Masonry Construction (Subpart Q), \$12.5 million for Ladders and Stairways (Subpart X), \$48.0 million for Electrical Construction (Subpart K), and \$7.6 million for Scaffolds (Subpart L), and no costs for Trenching (Subpart P). Using the baseline of full compliance with the existing standards, OSHA estimated that the incremental costs of

these standards would be about \$2.7 million for Underground Construction, \$2.2 million for Crane or Derrick Suspended Personnel Platforms, \$17.5 million for Concrete and Masonry Construction, and \$8.4 million for Ladders and Stairways. In addition, a cost savings of \$30.6 million for Electrical Construction, \$7.8 million for Scaffolds, and between \$11.7 million and \$42.8 million for Trenching is expected for these revisions. Thus, the net impact of these proposed actions in addition to this action would be increased annualized costs of \$171.8 million when using a baseline of current industry practice and an annual cost savings between \$46.8 million and \$77.7 million when using a baseline of full compliance with the existing standards.

Regulatory flexibility certification. Pursuant to the Regulatory Flexibility Act (Pub. L. 96-353, 94 Stat. 1164 (5 U.S.C. 60 et seq.)), the Assistant Secretary has made a preliminary assessment of the impact of the proposed standard and has concluded that it would not have a significant impact upon a substantial number of small entities. OSHA invites public comment concerning this preliminary conclusion.

The important criterion that governs a Regulatory Flexibility Analysis is whether the proposed standard would impose significant costs upon small entities. "Significance" is determined by the effect upon profits, market share, and the entity's financial viability. In particular, the proposed standard's effect upon small entities relative to its effect upon large entities needs to be specifically evaluated. That is, OSHA must determine whether the proposal would have a relatively greater negative effect upon small entities than upon large entities, thereby putting small entities at a competitive disadvantage, and if so, whether there are ways to minimize any differentially adverse effects without increasing worker risk.

If the costs of compliance for small firms are relatively minor and are proportional to the size of the firm, then there is no significant differential effect. In those cases involving large absolute costs, small firms may have greater difficulty in obtaining financing, and in those cases involving economies of scale in compliance, the burden on small firms will be greater than the burden on large firms. The proposed changes to Subpart M, however, require minimal capital expenditures and provide net cost savings to employers in comparison with the costs of compliance under the current standard. Furthermore, as its provisions are more performance

oriented than specification oriented, small entities can use the most cost-effective methods of employee protection best suited to their particular work situations. In addition, these costs would be a minimal component of the overall costs of the structures being built. As a result, small entities would not be put at a competitive disadvantage due to these compliance costs.

Thus, OSHA has concluded that this proposed standard would not have a significant adverse impact upon a substantial number of small entities.

The assessment is available for inspection and copying at the OSHA Technical Data Center, Room N-3670, 200 Constitution Avenue, NW, Washington, DC 20210. OSHA invites comments concerning the conclusions reached in the Regulatory Assessment.

V. Environmental Assessment

Finding of no significant impact. This proposed rule and its major alternatives have been reviewed in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.), the Guidelines of the Council on Environmental Quality (CEQ) (40 CFR Part 1500), and OSHA's DOL NEPA Procedures (29 CFR Part 11). As a result of this review, the Assistant Secretary for OSHA has determined that the proposed rule will have no significant environmental impact.

The proposed revisions to 29 CFR 1926.500-1926.502, Subpart M—Fall Protection, focus on the reduction of accidents or injuries by means of work practices and procedures, proper use and handling of equipment, and training, as well as on changes in language, definition, and format of the standard. These revisions do not impact on air, water, or soil quality, plant or animal life, the use of land, or other aspects of the environment. As such, these revisions are therefore categorized as excluded actions according to Subpart B, section 11.10, of the DOL NEPA regulations.

VI. References

1. Advisory Committee on Construction Safety and Health. *Transcripts of meetings held on November 29-30, 1977; January 10, 1978; February 14, 1978; December 5, 1978; December 16, 1978; June 29-30, 1982.*
2. U.S. Department of Labor, Occupational Safety and Health Administration. *Preliminary Regulatory Impact and Regulatory Flexibility Assessment of Subpart M—Fall Protection*. Office of Regulatory Analysis, Washington, DC, March 1984.

3. U.S. Department of Labor, Occupational Safety and Health Administration. *Occupational Fatalities Related to Roofs, Ceilings, and Floors as Found in Reports of OSHA Fatality/Catastrophe Investigations*, November 1979.

4. American National Standard ANSI A10.11-1979. *American National Standard for Safety Nets Used During Construction, Repair, and Demolition Operations*. American National Standards Institute, New York.

5. American National Standard, ANSI A10.14-1975. *Requirements for Safety Belts, Harnesses, Lanyards, Lifelines, and Droplines for Construction and Industrial Use*. American National Standards Institute, New York.

6. U.S. Department of Labor, Bureau of Labor Statistics. *Occupational Injuries and Illnesses in 1979: Summary*. Washington, DC, April 1981.

7. Andrew C. Sulowski. "Selecting Fall Arresting Systems." *National Safety News*, October 1979.

8. National Bureau of Standards (NBS). *NBSIR 76-1148 A Study of Personal Fall-Safety Equipment*. Washington, DC: NBS, June 1977.

9. International Standardization Organization (ISO), Secretariat Association Française de Normalisation (AFNOR). *Personal Fall Arresting Systems and Components*. (ISO/TC 94/SC4 NSOE). New York, NY: ANSI, 1983.

10. Noel, Georges; Ampoux, M., et al. *Safety Equipment in Construction and Public Works Transportation*. (No. 362) Technical Institute for Construction and Public Works, Montreuil, France, 1978.

11. British Standards Institution (BSI). *Specification for Industrial Safety Belts, Harnesses and Safety Lanyards*. (BS 1397). London, England: BSI, 1979.

12. Hearon, Bernard F. and Brinkley, James W. *Fall Arrest and Post-Fall Suspension: Literature Review and Directions for Further Research*. (AFAMRL-TK-84-021). Air Force Aerospace Medical Research Laboratory, Wright-Patterson AFB, Dayton, OH: 1984.

13. Written comments on OSHA's Proposed Rule on Powered Platforms for Exterior Building Maintenance (50 FR 2890, January 22, 1985), Docket No. S-700A.

14. Yancey, Carino and Sanasalone. *Perimeter Safety Net Projection Requirements*. Center for Building Technology, National Bureau of Standards, Washington, DC, May 1986 (NBSIR 85-3271).

VII. Recordkeeping

This proposal contains no recordkeeping requirements. However,

public comment is requested in the Specific Issues section of this preamble on whether the proposed training requirements impose an implicit recordkeeping requirement on employers.

VIII. Public Participation

Interested persons are invited to submit written data, views, and arguments with respect to this proposal. The comments must be postmarked by February 23, 1987, and submitted in quadruplicate to the Docket Officer, Docket No. S-208, U.S. Department of Labor, Occupational Safety and Health Administration, Room N-3670, 200 Constitution Avenue, NW., Washington, DC 20210.

The data, views, and arguments that are submitted will be available for public inspection and copying at the above address. All timely submissions received will be made a part of the record of this proceeding.

Additionally, under section 6(b)(3) of the OSH Act (29 U.S.C. 657), section 107 of the Construction Safety Act (41 U.S.C. 333), and 29 CFR 1911.11, interested parties may file objections to the proposal and request an informal hearing. The objections and hearing requests should be submitted in quadruplicate to the Docket Officer at the address above and must comply with the following conditions:

1. The objections must include the name and address of the objector;
2. The objections must be postmarked by February 23, 1987;
3. The objections must specify with particularity the provisions of the proposed rule to which each objection is taken and must state the grounds therefore;
4. Each objection must be separately stated and numbered; and
5. The objections must be accompanied by a detailed summary of the evidence proposed to be adduced at the requested hearing.

IX. State Plan Standards

The 25 States and territories with their own OSHA-approved occupational safety and health plans must adopt a comparable standard within six months of the publication date of the final rule. These States and territories are: Alaska, Arizona, California, Connecticut (for State and local government employees only), Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, New York (for State and local government employees only), Nevada, New Mexico, North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Virgin Islands, Washington, Wyoming. Until such time

as a comparable standard is promulgated, Federal OSHA will provide interim enforcement assistance, as appropriate, in these States and territories.

X. List of Index Terms

List of Subjects in 29 CFR Part 1928

Construction industry, Construction safety, Excavations, Hoisting safety, Occupational safety and health, Protective equipment, Safety, Tools.

Authority:

This document was prepared under the direction of John A. Pendergrass, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, 200 Constitution Avenue, NW., Washington, DC 20210.

Accordingly, pursuant to sections 4, 6(b) and 8(g) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657), section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 333), Secretary of Labor's Order No. 9-83 (48 FR 35736), and 29 CFR Part 1911, it is proposed to amend 29 CFR Part 1928 as set forth below.

Signed at Washington, DC this 17th day of November 1986.

John A. Pendergrass,
Assistant Secretary of Labor.

PART 1928—(AMENDED)

Subpart E—(Amended)

1. The authority citation for Subpart E of Part 1928 would continue to read as follows:

Authority: Sec. 107, Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, & Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 6754), 8-76 (41 FR 25059), or 9-83 (48 FR 35736), as applicable.

§§ 1926.104, 1926.105 and 1926.107 [Amended]

2. Sections 1926.104, 1926.105, and paragraphs (b), (c), and (f) of § 1926.107 would be removed and reserved.

Subpart H—(Amended)

3. The authority citation for Subpart H of Part 1928 would be revised to read as follows:

Authority: Sec. 107, Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, & Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 6754), 8-76 (41 FR 25059), or 9-83 (48 FR 35736), as applicable. Section 1928.250 also issued under 29 CFR Part 1911.

4. Paragraph (b)(2) of § 1926.250 would be revised to read as follows:

§ 1926.250 General requirements for storage.

(b)

(2) Employees required to work on stored material in silos, hoppers, tanks, and similar storage areas shall be equipped with lifelines and safety belts meeting the requirements of Subpart M of this part.

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Subpart P—(Amended)

5. The authority citation for Subpart P of Part 1928 would continue to read as follows:

Authority: Sec. 107, Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, & Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 6754), 8-76 (41 FR 25059), or 9-83 (48 FR 35736), as applicable. Section 1926.651 also issued under 29 CFR Part 1911.

6. Paragraph (l) of § 1926.651 would be removed and reserved, and paragraph (w) of § 1926.651 would be revised to read as follows:

§ 1926.651 Specific excavation requirements.

.

(l) [Reserved]

.

- (w) Where employees or equipment are required or permitted to cross over excavations, walkways or bridges shall be provided.

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Subpart Q—(Amended)

7. The authority citation for Subpart Q of Part 1928 would continue to read as follows:

Authority: Sec. 107, Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, & Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 6754), 8-76 (41 FR 25059), or 9-83 (48 FR 35736), as applicable.

§ 1926.700 [Amended]

8. Paragraph (b)(1) of § 1926.700 would be removed and reserved.

Subpart V—(Amended)

9. The authority citation for Subpart V of Part 1928 would be revised to read as follows:

Authority: Sec. 107, Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, &

Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 87541, 8-76 [41 FR 25059], or 9-83 [48 FR 35736], as applicable. Section 1926.951 also issued under 29 CFR Part 1911.

10. Paragraph (b)(4)(i) of § 1926.951 would be revised to read as follows:

§ 1926.951 Tools and protective equipment.

(b) * * *

(4)(i) Lifelines and lanyards shall comply with the provisions of § 1926.502.

11. Subpart M of Part 1926 would be revised to read as follows:

Subpart M—Fall Protection

§ 1926.500 Scope, application, and definitions applicable to this subpart.

§ 1926.501 Requirements to have fall protection.

§ 1926.502 Fall protection systems criteria and practices.

§ 1926.503 Training requirements.

Appendix A to Subpart M—Guardrail Systems

Appendix B to Subpart M—Roof Widths

Appendix C to Subpart M—Test Procedures for Evaluating Belt/Harness Systems and Positioning Device Systems

Subpart M—Fall Protection

Authority: Sec. 107, Contract Work Hours and Safety Standards Act (Construction Safety Act) (40 U.S.C. 333); Secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 9-83 [48 FR 35736]; and 29 CFR Part 1911.

§ 1926.500 Scope, application and definitions applicable to this subpart.

(a) *Scope and application.* (1) This subpart sets forth requirements to have fall protection for employees in construction, alteration, repair (including painting and decorating), and demolition workplaces covered under 29 CFR Part 1926. However, the provisions of this subpart do not apply when employees are only inspecting, investigating, or assessing workplace conditions.

(2) Section 1926.501 sets forth those workplaces, conditions, operations, and circumstances for which fall protection shall be provided except as follows:

(i) Requirements relating to fall protection for employees working on scaffolds are provided in 29 CFR 1926.451-1926.460 (Subpart L).

(ii) Requirements relating to fall protection for employees working on cranes, derricks, hoists, elevators, and conveyors are provided in 29 CFR 1926.550-1926.556 (Subpart N).

(iii) Requirements relating to fall protection for employees on pile driving equipment are provided in 29 CFR 1926.603 (Subpart O).

(iv) Requirements relating to fall protection for connectors performing steel erection and requirements for fall protection for workers on derrick and erection floors during steel erection, are provided in 29 CFR 1926.750-1926.752 (Subpart R).

(v) Requirements relating to fall protection for employees engaged in tunneling operations are provided in 29 CFR 1926.800-1926.804 (Subpart S).

(vi) Requirements relating to fall protection for employees engaged in power transmission and distribution are provided in 29 CFR 1926.950-1926.960 (Subpart V).

(vii) Requirements relating to fall protection for employees working on stairways and ladders are provided in 29 CFR 1926.1050-1926.1060 (Subpart X).

(3) Section 1926.502 sets forth the requirements for the installation, construction, and use of fall protection required by § 1926.501 and by other subparts of Part 1926, except as follows:

(i) Performance requirements for guardrail systems used on scaffolds and performance requirements for falling object protection used on scaffolds are provided in 29 CFR 1926.451-1926.460 (Subpart L).

(ii) Performance requirements for stairways, stairrail systems, and handrails are provided in 29 CFR 1926.1050-1926.1060 (Subpart X).

(iii) Specific requirements for safety railings used on derrick and erection floor during steel erection are provided in 29 CFR 1926.750 (Subpart R).

(iv) Additional performance requirements for personal climbing equipment, lineman's body belts, safety straps, and lanyards are provided in 29 CFR 1926.950-1926.960 (Subpart V).

(4) Section 1926.503 sets forth requirements for training in the installation and use of fall protection.

(b) *Definitions.* "Body belt (safety belt)" means a strap with means both for securing about the waist and for attaching to a lanyard, lifeline, or deceleration device.

"Body belt/harness system (personal fall arrest system)" means a combination of body belt or body harness, and lanyard, deceleration device, lifeline, and point of anchorage.

"Body harness" means a design of straps which is secured about the employee in a manner to distribute the arresting forces over at least the thighs, shoulders, and pelvis, with provisions for attaching a lanyard, lifeline, or deceleration device.

"Built-up roofing" means a weatherproofing cover, applied over roof decks, consisting of a liquid-applied system, a single-ply system, or a multiple-ply system. Liquid-applied systems generally consist of silicone rubber, plastics, or similar material applied by spray or roller equipment. Single-ply systems generally consist of a single layer of synthetic rubber, plastic, or similar material, and often, but not always, a layer of adhesive. Multiple-ply systems generally consist of layers of felt and bitumen. Any of the systems may be covered with a layer of mineral aggregate.

"Built-up roofing work" means the hoisting, storage, application, and removal of built-up roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

"Control zone" means an area designated and clearly marked in which overhead bricklaying, overhead bricklaying related work, and leading edge work may take place without the use of guardrail, body belt, or safety net systems to protect the employees in the area.

"Dangerous equipment" means equipment such as pickling or galvanizing tanks, degreasing units, machinery, electrical equipment, and other units which, as a result of form or function, may be hazardous to employees who fall onto or into such equipment.

"Deceleration device" means any mechanism, such as a rope grab, nip-stitch lanyard, specially-woven lanyard, and automatic self-retracting lifeline, which serves to dissipate more energy during a fall arrest than does a standard line or strap webbing lanyard.

"Deceleration distance" means the additional vertical distance a falling employee travels, excluding lifeline elongation, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body belt or body harness attachment point just prior to activation of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop, excluding lifeline elongation between those two points.

"Equivalent" means alternative designs, materials, or methods which the employer can demonstrate will provide an equal or greater degree of safety for employees than the method or item specified in the standard.

"Failure" means load refusal, breakage, or separation of component

parts. Load refusal is the point where the ultimate strength is exceeded.

"Force factor" means the ratio of the arresting force on a rigid metal object to the arresting force on a human body having the same weight as the object, both falling under identical conditions.

"Free fall distance" means the vertical distance an employee falls before the body belt/harness system begins to arrest the fall. It is measured as the distance between the locations of an employee's body belt or harness attachment points before and after the fall, excluding lanyard and lifeline elongation and deceleration distance.

"Guardrail system" means a vertical barrier erected to prevent employees from falling to lower levels.

"Hole" means any hole or other opening, more than two inches (5.1 cm) in its least dimension, in a floor, roof, or other walking/working surface.

"Lanyard" means a flexible line or strap webbing which is used to secure a body belt or body harness to a lifeline or directly to a point of anchorage.

"Leading edge" means the edge of a floor, roof, or formwork which changes location as additional floor, roof, or formwork sections are placed, formed, or constructed. Leading edges not actively under construction are considered to be "unprotected sides and edges."

"Lifeline (drop lines, trolley lines)" means a line provided for direct attachment to a worker's body belt, body harness, lanyard, or deceleration device. Such lifeline may be horizontal or vertical in application.

"Lower levels" means those areas to which an employee can fall. Such areas include ground levels, floors, ramps, runways, excavations, pits, tanks, material, water, equipment, and similar surfaces.

"Low-pitched roof" means a roof having a slope less than or equal to four in 12.

"Mechanical equipment" means all motor or human propelled wheeled equipment used for built-up roofing work, except wheelbarrows and mopcars.

"Opening" means any opening 30 inches (78 cm) or more high and 18 inches (46 cm) or more wide, in a wall or partition, through which employees can fall to a lower level.

"Overhand bricklaying and related work" means the process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. Related work includes mason tending and electrical installation incorporated into

the brick wall during the overhand bricklaying process.

"Positioning device system" means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall, and work with both hands free while leaning backward.

"Roof" means the exterior surface on the top of a building. This does not include floors or formwork which, because a building has not been completed, temporarily become the top surface of a building.

"Safety-monitoring system" means a safety system in which a competent person is responsible for recognizing and warning employees of fall hazards.

"Steep roof" means a roof having a slope greater than four in 12.

"Toeboard" means a low protective barrier to prevent the fall of materials and equipment to lower levels.

"Unprotected sides and edges" means any side or edge (except at entrances to points of access) of a floor, roof, ramp, or runway where there is no well or guardrail system at least 39 inches (1.0 m) high.

"Walking/working surface" means any surface, including formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be in order to perform their job duties.

"Warning line system" means a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which built-up roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

"Work area" means that portion of a walking/working surface where job duties are being performed.

§ 1926.501 Requirements to have fall protection.

(e) *General.* This paragraph sets forth the type of fall protection system required for specific areas and operations. All fall protection required by this section shall conform to the criteria set forth in § 1926.502 of this subpart.

(b) *Floors, low-pitched roofs, and other walking/working surfaces.* Employees on floors, low-pitched roofs, and other walking/working surfaces shall be protected from fall hazards as follows:

(1) *Unprotected sides and edges.* Except as provided in paragraph (b)(2) through (b)(10) below, employees on floors, low-pitched roofs, and other walking/working surfaces with unprotected sides and edges six feet (1.8

m) or more above lower levels, shall be protected as follows:

(i) By the use of guardrail systems when the floor, roof, or other walking/working surface is 18 inches (.5 m) or more in width:

(ii) By the use of guardrail systems, body belt/harness systems, or safety net systems when the floor, roof, or other walking/working surface is less than 18 inches (.5 m) in width.

(2) *Leading edges.* (i) Employees constructing leading edges six feet (1.8 m) or more above lower levels shall be protected by guardrail systems, body belt/harness systems, safety net systems, or safety monitoring systems;

(ii) Employees on floors, low-pitched roofs, and other walking surfaces where leading edges are under construction six feet (1.8 m) or more above lower levels, but who are not constructing the leading edge, shall be protected by guardrail systems or control zone systems along the leading edge.

(3) *Hoist areas.* (i) Employees in hoist areas six feet (1.8 m) or more above lower levels shall be protected by guardrail systems or body belt/harness systems.

(ii) *Exception:* During hoisting operations, employees leaning through the access opening or out over the edge shall be protected by the use of body belt/harness systems.

(4) *Holes.* Employees on floors, low-pitched roofs, and other walking/working surfaces with holes more than six feet (1.8 m) above lower levels shall be protected by covers or guardrail systems.

(i) When covers are used for protection, they shall be closed when the hole is not in use.

(ii) When the cover is open, employees shall be protected by guardrail systems.

(5) *Formwork and reinforcing steel.* Employees on the face of formwork or reinforcing steel six feet (1.8 m) or more above lower levels shall be protected by body belt/harness systems, safety net systems, or positioning device systems.

(6) *Ramps, walkways, bridges, and runways.* Employees on ramps, walkways, bridges, and runways six feet (1.8 m) or more above lower levels shall be protected by guardrail systems.

(7) *Excavations.* (i) Employees at the edges of excavations six feet (1.8 m) or more in depth shall be protected by guardrail systems, fences, signs, or barricades, when the excavations are not readily seen because of plant growth or other visual barrier.

(ii) Employees at the edge of wells, pits, shafts, and similar excavations six feet (1.8 m) or more in depth shall be

protected by guardrail systems, fences, barricades, or covers.

(8) *Dangerous equipment.* (i) Employees less than six feet (1.8 m) above dangerous equipment shall be protected by guardrail systems or equipment guards.

(ii) Employees six feet (1.8 m) or more above dangerous equipment shall be protected by guardrail systems, body belt/harness systems, or safety net systems.

(9) *Overhand bricklaying and related work.* (i) Except as provided in paragraph (b)(9)(ii) of this section and paragraphs (b) (3), (4), (6), and (8) of this section, employees performing overhand bricklaying and related work six feet (1.8 m) or more above lower levels shall be protected by guardrail systems, body belt/harness systems, safety net systems, or control zone systems.

(ii) Employees reaching more than 10 inches (25 cm) below the level of the walking/working surface they are working on, shall be protected by a guardrail system, body belt/harness system, or safety net system.

(10) *Build-up roofing operations on low-pitched roofs.* Except as provided in paragraphs (b) (3), (4), (6), and (8) of this section, employees performing build-up roofing operations on low-pitched roofs with unprotected sides and edges 16 feet (4.9 m) or more above lower levels shall be protected by guardrail systems, body belt/harness systems, safety net systems, safety monitoring systems, or a combination of warning line system and guardrail, body belt/harness, safety net, or safety monitoring system, or, on roofs 50 feet (15.25 m) or less in width (see Appendix B), by the use of a safety monitoring system.

Note.—Except as provided in paragraphs (b) (3), (4), (6), and (8) of this section, fall protection is not required for employees performing build-up roofing operations on low-pitched roofs with unprotected sides and edges less than 16 feet (4.9 m) above lower levels.

(c) *Steep roofs.* Employees on steep roofs with unprotected sides and edges or holes six feet (1.8 m) or more above lower levels shall be protected from fall hazards by guardrail systems, body belt/harness systems, safety net systems, or covers.

(d) *Wall openings.* Employees working on, at, or near wall openings (including those with chutes attached) where the outside bottom edge of the wall opening is more than six feet (1.8 m) above lower levels and the inside bottom edge of the wall opening is less than 39 inches (1.0 m) above the walking/working surface, shall be protected from falling through or into the

wall opening by the use of a guardrail system.

(e) *Protection from falling objects.* In addition to wearing hardhats, employees shall be protected from falling objects by toeboards, screens, or guardrail systems erected to prevent objects from falling from higher levels, or they shall be protected by a canopy structure erected to deflect falling objects, or the area to which objects could fall shall be marked with signs or barricaded and employees prohibited from entering the area, or the potential fall objects shall be placed away from the edge a distance sufficient to prevent them from going over the edge should they be accidentally displaced.

§ 1926.502 Fall protection systems criteria and practices.

(a) *General.* (1) Fall protection systems required by this part shall comply with the applicable provisions of this section.

(2) All fall protection shall be provided, installed, and used before employees begin any other work on or from the surface or area where fall protection is required.

(b) *Guardrail systems.* Guardrail systems and their use shall comply with the following provisions:

(1) Top edge height of toprails, or equivalent guardrail system members, shall be 42 inches (1.1 m) plus or minus three inches (8 cm) above the walking/working level.

(2) Midrails, screens, mesh, intermediate vertical members, or equivalent intermediate structural members, shall be installed between the top edge of the guardrail system and the walking/working surface when there is no wall or parapet wall at least 21 inches (53 cm) high.

(i) Midrails, when used, shall be installed at a height midway between the top edge of the guardrail system and the walking/working level.

(ii) Screens and mesh, when used, shall extend from the top rail to the walking/working level and along the entire opening between top rail supports.

(iii) Intermediate members (such as balusters), when used between posts, shall be not more than 19 inches (48 cm) apart.

(iv) Other structural members shall be installed such that there are no openings in the guardrail system that are more than 19 inches (5 m) wide.

(3) Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied within two inches (5.1 cm) of the top edge, in any outward or downward direction, at any point along the top edge.

Note.—Guardrail system components selected and constructed in accordance with Appendix A of this Subpart will be deemed to meet this requirement.

(4) When the 200 pound (890 N) test load specified in paragraph (b)(3) of this section is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches (1.0 m) above the walking/working level.

Note.—Guardrail system components selected and constructed in accordance with Appendix A of this Subpart will be deemed to meet this requirement.

(5) Midrails, screens, mesh, intermediate vertical members, solid panels, and equivalent intermediate structural members shall be capable of withstanding, without failure, a force of at least 150 pounds (668 N) applied in any downward or outward direction at any point along the midrail or other member.

Note.—Guardrail system components selected and constructed in accordance with Appendix A of this Subpart will be deemed to meet this requirement.

(6) Guardrail systems shall be so surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing which could cause an employee to fall.

(7) The ends of all top rails and midrails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.

(8) Steel banding and plastic banding shall not be used as toprails or midrails.

(9) Toprails and midrails shall be at least one-quarter inch (0.6 cm) nominal diameter or thickness.

(10) When guardrail systems are used at hoisting areas during the performance of build-up roofing operations on low-pitched roofs, a minimum of four feet (1.2 m) of guardrail system shall be erected on each side of the access point through which materials are hoisted. When guardrail systems are used at pipe outlets, a minimum of four feet (1.2 m) of guardrail system shall be erected on each side of the pipe.

(11) When guardrail systems are used at hoisting areas, a chain, gate or removable guardrail section shall be placed across the access opening between guardrail sections when hoisting operations are not taking place.

(12) When guardrail systems are used at holes, they shall be erected on all unprotected sides or edges of the hole.

(13) When guardrail systems are used around holes used for the passage of materials, the hole shall have not more than two sides provided with removable guardrail sections to allow the passage

o: materials. When the hole is not in use, it shall be closed over with a cover, or a guardrail system shall be provided along all unprotected sides or edges.

(14) When guardrail systems are used around holes which are used as points of access (such as ladders), they shall be provided with a gate or be so offset that a person cannot walk directly into the hole.

(15) Guardrail systems on ramps and runways shall be erected along each unprotected side or edge; however, when operating conditions preclude installation of a guardrail system along both sides, the guardrail system may be omitted along one side provided a ramp or runway at least 18 inches (1.5 m) wide is used.

(c) *Safety net systems.* Safety net systems and their use shall comply with the following provisions:

(1) Safety nets shall be installed as close as practicable under the walking/working surface on which employees are working, but in no case more than 25 feet (7.7 m) below such level. *Exception:* The 25-foot (7.7 m) limitation does not apply to nets used on bridge construction where safety nets are used for fall protection. In such cases, only one level of nets is required.

(2) Safety nets shall extend outward at least 15 feet (4.8 m) from the outermost projection of the work surface.

(3) Safety nets shall be installed with sufficient clearance under them to prevent contact with the surface or structures below when subjected to an impact force equal to the drop test specified in paragraph (c)(4)(i) of this section.

(4) Safety nets and their installations shall be capable of absorbing an impact force equal to that produced by the drop test specified in paragraph (c)(4)(i) of this section.

(i) Safety nets and safety net installations shall be drop-tested at the jobsite before being used as a fall protection system. The drop-test shall consist of a 400 pound (180 kg) bag of sand 30 ± 2 inches (78 $\pm$ 5 cm) in diameter dropped into the net from the highest walking/working surface on which employees are to be protected.

(ii) *Exception:* When the employer can demonstrate that a drop-test is not feasible or practicable, the net and net installation shall be certified by a qualified person to be in compliance with the provisions of paragraphs (c)(3) and (c)(4)(i) of this section.

(5) Safety nets shall be inspected weekly for mildew, wear, damage, and other deterioration. Defective components shall be removed from service.

(6) Materials, scrap pieces, and tools which have fallen into the safety net shall be removed as soon as possible from the net and at least before the next work shift.

(7) The maximum size of each safety net mesh opening shall not exceed 36 square inches (230 cm²) nor be longer than six inches (15 cm) on any side measured center-to-center of mesh ropes or webbing. All mesh crossings shall be secured to prevent enlargement of the mesh opening.

(8) Each safety net (or section of it) shall have a border rope for webbing with a minimum breaking strength of 5,000 pounds (22.2 kN).

(9) Connections between safety net panels shall be as strong as integral net components and shall be spaced not more than six inches (15 cm) apart.

(d) *Body belt/harness systems.* Body belt/harness systems and their use shall comply with the provisions set forth below. Body belt/harness systems which comply with the provisions of Appendix C will be deemed to meet the requirements of paragraphs (d) (5), (8), and (16) of this section, provided that when a rigid test weight is used to evaluate the criteria in Appendix C, a force factor of 1.4 is used.

(1) Body belt/harness systems and components shall be used only for employee fall protection.

(2) Body belt/harness systems or components subjected to impact loading shall be immediately removed from service and shall not be used again for employee protection unless inspected and determined by a competent person to be undamaged and suitable for reuse.

(3) Lifelines shall be protected against being cut or abraded.

(4) Body belt/harness systems shall be rigged to minimize free fall distance with a maximum free fall distance allowed of six feet (1.8 m), and such that the employee will not contact any lower level.

(5) Body belt/harness systems shall decelerate and bring the employee to a complete stop within 42 inches (1.1 m), excluding lifeline elongation, after any free fall distance.

(6) Body belt/harness systems, when stopping or preventing a fall, shall not produce an arresting force on an employee of more than 10 times the employee's weight (10 gn) or 1,800 pounds (8 kN), whichever is lower.

(7) Body belts shall be worn with the lanyard or deceleration device attachment point positioned at one of the following locations: on the belt anywhere between the sides of the body on the back portion of the belt when body belts are worn; and above the

waist in the back, or above the wearer's head, when body harnesses are worn.

(8) Body belts shall be at least one and five-eighths (1 $\frac{5}{8}$) inches (4.1 cm) wide.

(9) Hardware shall be drop forged, pressed or formed steel, or made of materials equivalent in strength.

(10) Hardware shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to the attached belt or lanyard.

(11) When vertical lifelines (droplines) are used, not more than one employee shall be attached to any one lifeline.

(12) Body belt/harness systems shall be secured to anchorages capable of supporting at least twice the potential impact load of an employee's fall.

(13) Vertical lifelines (droplines) shall have a minimum tensile strength of 5,000 pounds (22.2 kN), except that self-retracting lifelines and lanyards which automatically limit free fall distance to two feet (.61 m) or less shall have a minimum tensile strength of 3,000 pounds (13.3 kN).

(14) Horizontal lifelines (trolley lines) shall have a tensile strength capable of supporting a fall impact load of at least 5,000 pounds (22.2 kN) per employee using the lifeline, applied anywhere along the lifeline.

(15) Lanyards shall have a minimum tensile strength of 5,000 pounds (22.2 kN).

(16) All components of body belt/harness systems whose strength is not otherwise specified in paragraph (d) of this section shall be capable of supporting a minimum fall impact load of 5,000 pounds (22.2 kN) applied at the lanyard point of connection.

(17) Snap-hooks shall not be connected to loops made in webbing-type lanyards.

(18) Snap-hooks shall not be connected to each other.

(19) Not more than one snap hook shall be connected to any one deer-ring.

(20) Body belt/harness systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration, and defective components shall be removed from service if their function or strength have been adversely affected.

(21) When body belt/harness systems are used at hoist areas, they shall not be attached to hoists or guardrail systems.

(22) When body belt/harness systems are used at hoist areas, they shall be rigged to allow the movement of employees only as far as the edge of the walking/working surface.

(e) *Positioning device systems.* Positioning device systems and their use

shall conform to the following provisions:

(1) Positioning devices shall be rigged such that an employee cannot free fall more than 24 inches (61 cm).

(2) All hardware shall have a corrosion-resistant finish, and all surfaces and edges shall be smooth to prevent damage to the attached belt or connecting assembly.

(3) Positioning devices shall be secured to an anchorage capable of supporting at least twice the potential impact load of an employee's fall.

(4) Connecting assemblies shall have a minimum tensile strength of 5,000 pounds [22.2 kN].

(5) Positioning device systems shall be inspected prior to each use for mildew, wear, damage, and other deterioration, and defective components shall be removed from service if their function or strength has been adversely affected.

(6) **Warning line systems.** Warning line systems and their use shall comply with the following provisions:

(i) The warning line shall be erected around all sides of the work area.

(ii) When mechanical equipment is not being used, the warning line shall be erected not less than six feet (1.8 m) from the roof edge.

(iii) When mechanical equipment is being used, the warning line shall be erected not less than six feet (1.8 m) from the roof edge which is parallel to the direction of mechanical equipment operation, and not less than 10 feet (3.1 m) from the roof edge which is perpendicular to the direction of mechanical equipment operation.

(iv) Points of access, materials handling areas, storage areas, and hoisting areas shall be connected to the work area by an access path formed by two warning lines.

(v) When the path to a point of access is not in use, a rope, wire, chain, or other barricade, equivalent in strength and height to the warning line, shall be placed across the path at the point where the path intersects the warning line erected around the work area, or the path shall be offset such that a person cannot walk directly into the work area.

(6) Warning lines shall consist of ropes, wires, or chains, and supporting stanchions erected as follows:

(i) The rope, wire, or chain shall be flagged at not more than six foot (1.8 m) intervals with high-visibility material.

(ii) The rope, wire, or chain shall be rigged and supported in such a way that its lowest point (including sag) is no less than 34 inches (9 m) from the walking/working surface and its highest point is no more than 39 inches (1.0 m) from the walking/working surface;

(iii) After being erected, with the rope, wire, or chain attached, stanchions shall be capable of resisting, without tipping over, a force of at least 16 pounds (71 N) applied horizontally against the stanchion, 30 inches (8 m) above the walking/working surface, perpendicular to the warning line, and in the direction of the floor, roof, or platform edge;

(iv) The rope, wire, or chain shall have a minimum tensile strength of 500 pounds (227 kg), and after being attached to the stanchions, shall be capable of supporting, without breaking, the loads applied to the stanchions as prescribed in paragraph f(2)(iii) of this section; and

(v) The line shall be attached at each stanchion in such a way that pulling on one section of the line between stanchions will not result in slack being taken up in adjacent sections before the stanchion tips over.

(7) Employees not performing built-up roofing work shall not be allowed in the area between a roof edge and a warning line.

(8) Mechanical equipment shall be used or stored only in areas where employees are protected by a warning line system, guardrail system, or body belt system.

(9) **Control zone systems.** Control zone systems and their use shall conform to the following provisions:

(i) For leading edges on floors, low-pitched roofs, and other walking/working surfaces, the control zone shall be defined by a line erected not less than six feet (1.8 m) nor more than 25 feet (7.7 m) from the leading edge. The line shall extend along the entire length of the leading edge and shall be approximately parallel to the leading edge. The line shall be connected on each side to a guardrail system or wall.

(ii) For overhand bricklaying operations, the control zone shall be defined by a line erected not less than 10 feet (3.1 m) nor more than 15 feet (4.5 m) from the working edge. The line shall extend for a distance sufficient for the control zone to enclose all employees performing overhand bricklaying and related work at the working edge and shall be approximately parallel to the working edge. Additional lines shall be erected at each end to form an enclosed area.

(iii) Control zone and access path lines shall consist of ropes, wires, tapes, or equivalent materials, and supporting stanchions as follows:

(i) Each line shall be flagged or otherwise clearly marked at not more than six foot (1.8 m) intervals with high-visibility material.

(ii) For leading edge work, each line shall be rigged and supported in such a

way that its lowest point (including sag) is not less than 39 inches (1 m) from the walking/working surface and its highest point is not more than 45 inches (1.3 m) from the walking/working surface.

(iii) For overhand bricklaying operations, each line shall be rigged and supported in such a way that its lowest point (including sag) is not less than 40 inches (1.3 m) from the walking/working surface and its highest point is not more than 50 inches (1.3 m) from the walking/working surface.

(iv) Each line shall have a minimum tensile strength of 200 pounds (91 kg).

(4) On floors and roofs where guardrail systems are not in place prior to the beginning of overhand bricklaying operations, control zones shall be connected to points of access and material handling areas and storage areas by an access path formed by two lines similar in construction to those used to delineate the control zone.

(5) On floors and roofs where guardrail systems are not in place, employees performing overhand bricklaying and related work, or who are performing leading edge work, shall not be allowed outside of the control zone unless protected by a body belt system or safety net system.

(6) On floors and roofs where guardrail systems are in place, the guardrail systems may be removed and a control zone system erected only to the extent necessary to accomplish one day's amount of overhand bricklaying or leading edge work.

(7) Employees not performing overhand bricklaying, related work, or leading edge work, shall not be allowed in the control zone.

(8) **Safety monitoring systems.** Safety monitoring systems and their use shall comply with the following provisions:

(1) Persons monitoring the safety of other employees:

(i) Shall be competent in recognizing fall hazards;

(ii) Shall warn employees when it appears that the employees are unaware of a fall hazard or are acting in an unsafe manner;

(iii) Shall be on the same walking/working surface as, and within visual sighting distance of, the employees being monitored;

(iv) Must be close enough to communicate orally with the employees; and

(v) Must not be so busy with other responsibilities that the monitoring function is encumbered.

(2) Mechanical equipment shall not be used or stored in areas where safety monitoring systems are being used.

(3) Employees not engaged in built-up roofing work shall not be allowed in an area where built-up-roofing employees are protected by a safety monitoring system.

(i) *Covers.* Covers for holes in floors, roofs, and other walking/working surfaces shall comply with the following provisions:

(1) Covers located in roadways and vehicular aisles shall be capable of supporting, without failure, at least twice the maximum axle load of the largest vehicle expected to cross over the cover.

(2) All other covers shall be capable of supporting, without failure, the maximum total anticipated load of employees, equipment, and materials, to be applied to the cover at any one time, or 250 pounds (114 kg), whichever is greater.

(3) All covers shall be installed so as to prevent accidental displacement.

(i) *Protection from falling objects.* Falling object protection shall comply with the following provisions:

(1) Toeboards, when used as falling object protection, shall be erected along the edge of the overhead walking/working surface for a distance sufficient to protect employees below.

(2) Toeboards shall be capable of withstanding, without failure, a force of at least 50 pounds (222 N) applied in any downward or outward direction at any point along the toeboard.

(3) Toeboards shall be a minimum of three and one-half inches (9 cm) in vertical height from their top edge to the level of the walking/working surface. They shall have not more than one-half inch (1.3 cm) clearance above the walking/working surface. They shall be solid or have openings not over one inch (2.5 cm) in greatest dimension.

(4) Where tools, equipment, or materials are piled higher than the top edge of a toeboard, paneling or screening shall be erected from the walking/working surface or toeboard to the top of a guardrail system's top rail or midrail, for a distance sufficient to protect employees below.

(5) Guardrail systems, when used as falling object protection, shall have all openings small enough to reject passage of potential falling objects.

(6) During the performance of overhead bricklaying and related work:

(i) No materials or equipment except masonry and mortar shall be stored within four feet (1.2 m) of the working edge.

(ii) Excess mortar, broken or scattered masonry units, and all other materials and debris shall be kept cleared from

the work area by removal at regular intervals.

(7) During the performance of built-up roofing work:

(i) Materials and equipment shall not be stored within six feet (1.8 m) of a roof edge unless guardrails are erected at the edge.

(ii) Materials which are piled, grouped, or stacked near a roof edge shall be stable and self-supporting.

§ 1926.503 Training requirements.

(a) The employer shall provide a training program for all employees exposed to fall hazards. The program shall enable employees to recognize the hazards of falling and shall train them in the procedures to be followed in order to prevent falls to lower levels and through or into holes and openings in walking/working surfaces and walls.

(1) The employer shall assure that employees have been trained and instructed in the following areas, as applicable:

(i) The identification of fall hazards in the work area;

(ii) The use and operation of guardrail systems, body belt/harness systems, safety net systems, warning line systems, safety monitoring systems, control zones, and other protection to be used;

(iii) The correct procedures for erecting, maintaining, disassembling, and inspecting the systems to be used;

(iv) The role of each employee in the safety monitoring system when this system is used;

(v) The limitations on the use of mechanical equipment during the performance of built-up roofing work on low-pitched roofs;

(vi) The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection; and

(vii) The standards contained in this subpart.

(2) Training and retraining shall be provided for each employee as necessary.

Appendix A to Subpart M—Guardrail Systems

The standard requires guardrail systems and components to be designed and built to meet the requirements of § 1926.502(b) (3), (4), and (5). This Appendix serves as a non-mandatory guideline to assist employers in complying with these requirements. Although employers may use other configurations to comply with these requirements, guardrail system components which meet the following guidelines will be considered as acceptable components that meet the requirements of § 1926.502(b) (3), (4), and (5). Components for which no specific guidelines are given in this

Appendix (e.g., joints, base connections) must be designed and constructed in accordance with the capacity requirements of § 1926.502(b) (3), (4), and (5).

(1) For wood railings: Wood components shall be minimum 1500 lb-ft/in² fiber (stress grade) construction grade lumber; the posts shall be at least 2-inch by 4-inch lumber spaced not more than eight feet apart on centers; the top rail shall be at least 2-inch by 4-inch lumber, the intermediate rail shall be at least 1-inch by 6-inch lumber. All lumber dimensions are nominal sizes as provided by the American Softwood Lumber Standards, dated January 1970.

(2) For pipe railings: posts, top rails, and intermediate railings shall be at least one and one-half inches nominal diameter with posts spaced not more than eight feet apart on centers.

(3) For structural steel railings: posts, top rails, and intermediate rails shall be at least 2-inch by 2-inch by 76-inch angles, with posts spaced not more than eight feet apart on centers.

Appendix B to Subpart M—Roof Widths

This Appendix serves as a guideline to assist employers in complying with the requirements of § 1926.501(c)(9), which provides that safety monitoring systems may be used as the only means of fall protection during the performance of built-up roofing operations on low-pitched roofs 50 feet (15.25 m) or less in width. Each example in the appendix shows a roof plan or plans and indicates where each roof or roof area is to be measured to determine its width. Section views or elevation views are shown where appropriate. Some examples show "correct" and "incorrect" subdivisions of irregularly shaped roofs divided into smaller, regularly shaped areas. In all examples, the dimension selected to be the width of an area is the lesser of the two primary dimensions of the area, as viewed from above. Example A shows that on a simple rectangular roof, width is the lesser of the two primary overall dimensions. This is also the case with roofs which are sloped toward or away from the roof center, as shown in Example B.

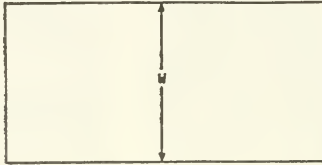
Many roofs are not simple rectangles. Such roofs may be broken down into subareas as shown in Example C. The process of dividing a roof area can produce many different configurations. Example C gives the general rule of using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than 50 feet wide. The intent is to minimize the number of roof areas where safety monitoring systems alone are sufficient protection.

Roofs which are comprised of several separate, noncontiguous roof areas, as in Example D, may be considered as a series of individual roofs. Some roofs have penthouses, additional floors, courtyard openings, or similar architectural features: Example E shows how the rule for dividing roofs into subareas is applied to such configurations. Irregular, nonrectangular roofs must be considered on an individual basis, as shown in Example F.

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Example A.

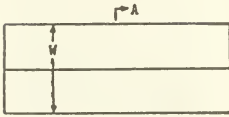
RECTANGULAR SHAPED ROOFS



PLAN VIEW

Example B.

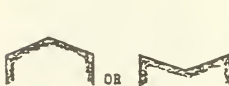
SLOPED RECTANGULAR SHAPED ROOFS



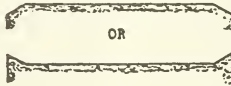
PLAN VIEW



PLAN VIEW



SECTION A-A

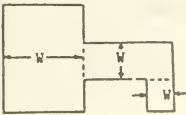


SECTION B-B

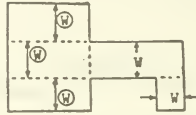
Example C.

IRREGULARLY SHAPED ROOFS WITH RECTANGULAR SHAPED SECTIONS

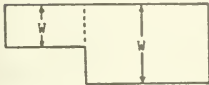
Such roofs are to be divided into sub-areas by using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than or equal to 50 feet (15.25 meters) in width, in order to limit the size of roof areas where paragraph 1926.500(g)(1)(iii) can be applied. Dotted lines are used in the examples to show the location of dividing lines. (W) denotes incorrect measurements of width.



Correct



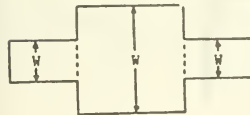
Incorrect



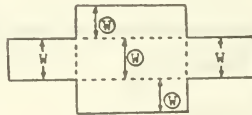
Correct



Incorrect



Correct

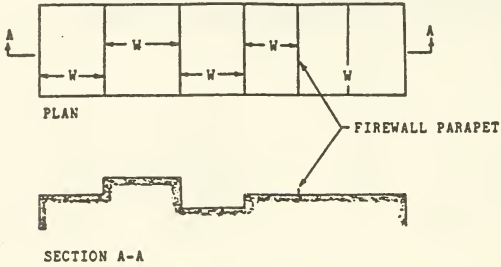


Incorrect

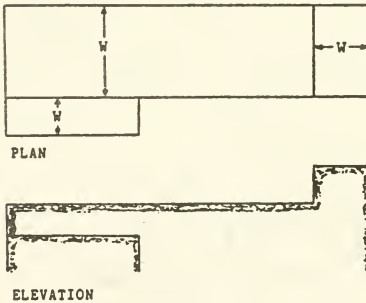
Example D.

SEPARATE, NON-CONTIGUOUS ROOF AREAS

1.



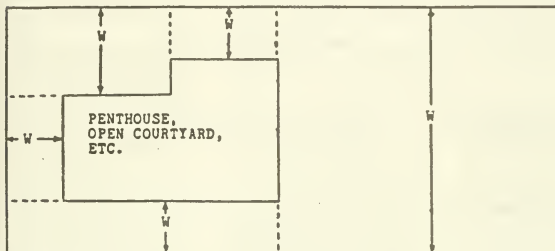
2.



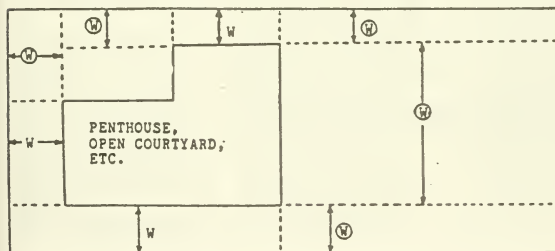
Example E.

ROOFS WITH PENTHOUSES, OPEN COURTYARDS, ADDITIONAL FLOORS, ETC.

Such roofs are to be divided into sub-areas by using dividing lines of minimum length to minimize the size and number of the areas which are potentially less than or equal to 50 feet (15.25 meters) in width, in order to limit the size of roof areas where paragraph 1926.500(g)(1)(iii) can be applied. Dotted lines are used in the examples to show the location of dividing lines. (U) denotes incorrect measurements of width.

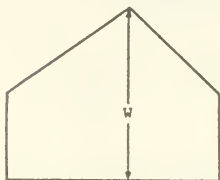


Correct

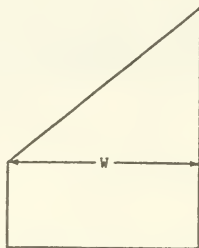


Example F.

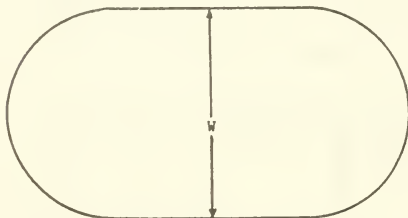
IRREGULAR, NON-RECTANGULAR SHAPED ROOFS



PLAN



PLAN



PLAN

Appendix C to Subpart M—Test Procedures for Evaluating Body Belt/Harness Systems and Positioning Device Systems

The standard requires body belt/harness systems and components to meet the specified performance criteria of § 1926.502(d) (5), (6), and (18), and positioning device systems and components to meet similar requirements of § 1926.502(e) (3) and (4). This Appendix serves as a nonmandatory guideline to assist employers in complying with these requirements. Body belt/harness systems and positioning device systems tested by manufacturers in conformance with the following guidelines will be considered as acceptable systems and components that meet the requirements listed above, provided a force factor of 1.4 is used.

Testing Methods For Body Belt/Harness Systems.

(a) *General.* (1) Lifelines and lanyards shall be attached to a fixed anchorage and connected to the body belt/harness or positioning device in the same manner as they would be used to protect employees, except lanyards shall be tested only when connected directly to the anchorage and not to a lifeline.

(2) The fixed anchorages shall be rigid, and shall not have a deflection greater than .04 inches (1 mm) when a force of 2,250 pounds (10 kN) is applied.

(3) The lanyard or lifeline used to create the free fall distance shall be the one supplied with the system, or, in its absence, the worse case lanyard or lifeline intended to be used with the system.

(4) The test weight for each test shall be hoisted to the required level and shall be quickly and cleanly released without imparting any appreciable motion to it.

(5) The strength and force test shall each consist of dropping each specified weight one time without failure of the system being tested. A new system shall be used for each test.

(6) The maximum elongation shall be recorded during the strength test for lanyard systems, and during the force test for all other systems.

(b) *Strength test.* (1) During the testing of all systems, a test weight of 300 pounds plus or minus five pounds (136 kg plus or minus 2.5 kg) shall be used. The weight shall be a rigid, metal cylindrical object or torso-shaped object with a girth of 38 inches plus or minus four inches (96 cm plus or minus 10 cm).

(2) For lanyard systems, the lanyard length shall be six feet plus or minus two inches (1.83 m plus or minus 5 cm) as measured from the fixed anchorage to the attachment on the body belt/harness.

(3) For rope grab-type deceleration systems the length of the lifeline above the centerline of the grabbing mechanism to the lifeline's

anchorage point shall not exceed two feet (0.61 m).

(4) For lanyard systems, for systems with deceleration devices which do not automatically limit free fall distance to two feet (0.61 m) or less, and for systems with deceleration devices which have a connection distance in excess of one foot (0.3 m) (measured between the centerline of the lifeline and the attachment point to the body belt or harness), the test weight shall fall free from a point that is 1.5 feet (46 cm) above the anchorage point, to its free hanging location (a total of 7.5 feet (2.3 m) free fall distance) without interference, obstruction, or hitting the floor or ground during the test.

(5) For deceleration devices with integral lifelines or lanyards which automatically limit free fall distance to two feet (0.61 m) or less, the test weight shall free fall a distance of four feet (1.22 m).

(6) Worst case, normal, and permitted use situations of the system shall be evaluated. (7) Failure for the strength test shall consist of any breakage or slippage sufficient to permit the weight to fall free from the belt or harness.

(8) Following the test, the system need not be capable of further operation; however, such a non-use condition for deceleration devices shall be readily apparent.

(c) *Force test.* (1) For lanyard systems, (i) A test weight of 150 pounds plus or minus three pounds (69 kg plus or minus 1.6 kg) shall be used. The weight shall be a rigid, metal cylindrical object or torso-shaped object with a girth of 38 inches plus or minus four inches (96 cm plus or minus 10 cm).

(ii) Lanyard length shall be six feet plus or minus two inches (1.83 m plus or minus 5 cm) as measured from the fixed anchorage to the attachment on the body belt/harness.

(iii) The test weight shall fall free from the anchorage level to its hanging location (a total of six feet (1.83 m) free fall distance) without interference, obstruction, or hitting the floor or ground during the test.

(2) For all other systems, (i) A test weight of 220 pounds plus or minus three pounds (100 kg plus or minus 1.6 kg) shall be used.

The weight shall be a rigid, metal cylindrical object or torso-shaped object with a girth of 38 inches plus or minus four inches (96 cm plus or minus 10 cm).

(ii) The fall distance to be used in the test shall be the maximum fall distance physically permitted by the system during normal use conditions, up to a maximum free fall distance for the test weight of six feet (1.83 m), except as follows:

(A) For deceleration systems which have a connection link or lanyard, the test weight shall free fall a distance equal to the connection distance (measured between the centerline of the lifeline and the attachment point to the body belt or harness).

(B) For deceleration devices with integral lifelines or lanyards which automatically limit free fall distance to two feet (0.61 m), the test weight shall free fall a distance equal to that permitted by the system in normal use. (For example, to test a system with a self-retracting lifeline or lanyard, the test weight shall be supported and the system allowed to retract the lifeline or lanyard as it would in normal use. The test weight would then be released and the force and deceleration distance measured).

(3) Worst case, normal, and permitted use situations of the system shall be evaluated.

(4) The force test is failed whenever the recorded maximum arresting force exceeds 1,800 pounds (8.0 kN) when using the 150 pound (69 kg) weight, or 2,500 pounds when using the 220 pound (100 kg) weight.

(5) Following this test, the system need not be capable of further operation; however, all such incapacities of deceleration devices shall be readily apparent.

Testing Methods For Positioning Device Systems

(a) *General.* (1) Single strap positioning devices, shall have one end attached to a fixed anchorage and the other end connected to a body belt/harness in the same manner as they would be used to protect employees. Double strap positioning devices, similar to window cleaner's belts, shall have one end of the strap attached to a fixed anchorage and the other end shall hang free. The body belt/harness shall be attached to the strap in the same manner as it would be used to protect employees. The two strap ends shall be adjusted to their maximum span.

(2) The fixed anchorage shall be rigid, and shall not have a deflection greater than .04 inches (1 mm) when a force of 2,250 pounds (10 kN) is applied.

(3) During the testing of all systems, a test weight of 250 pounds plus or minus three pounds (113 kg plus or minus 1.6 kg) shall be used. The weight shall be a rigid object with a girth of 38 inches plus or minus four inches (96 cm plus or minus 10 cm).

(4) Each test shall consist of dropping the specified weight one time without failure of the system being tested. A new system shall be used for each test.

(5) The test weight for each test shall be hoisted exactly four feet (1.2 m) above its "at rest" position, and shall be dropped so as to permit a vertical free fall of four feet (1.2 m).

(6) The test is failed whenever any breakage or slippage occurs which permits the weight to fall free of the system.

(7) Following the test, the system need not be capable of further operation; however, all such incapacities shall be readily apparent.

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REGULATORY IMPACT AND REGULATORY FLEXIBILITY
ANALYSIS OF SUBPART M - FALL PROTECTION
(29 CFR Part 1926)

U.S. Department of Labor
Occupational Safety and
Health Administration
Office of Regulatory
Analysis
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I. EXECUTIVE SUMMARY

INTRODUCTION

Executive Order 12866 and the Regulatory Flexibility Act require OSHA to analyze the costs, benefits, and other consequences and impacts associated with this standard. Consistent with these requirements, OSHA has prepared this regulatory impact analysis for the revised subpart M standard regulation.

This analysis includes a description of the industries affected by the regulation, the evaluation of the risks addressed, the assessment of the benefits attributable to the revised standard, the determination of the technological feasibility of the new requirements, the estimation of the costs of compliance with subpart M requirements, the determination of the economic feasibility of compliance with the standard, and the analysis of the economic and other impacts associated with this rulemaking.

AFFECTED INDUSTRIES

The requirements of the revised subpart M standard apply to all establishments in the construction industry. As classified by the 1987 Standard Industrial Classification (SIC) manual, the industry can be divided into three broad types of activities: building construction general contractors (SIC 15), heavy

construction general and special trade contractors (SIC 16), and construction by other special trade contractors (SIC 17).

The total value of construction work is approximately \$500 billion annually. About 75 percent of this amount (\$370 billion) involves the construction of buildings, including single family houses (\$124 billion). The total value of nonbuilding construction work includes \$45 billion for the construction of highways, streets, parking areas, bridges, and tunnels, and another \$13 billion for the construction of sewers and water mains.

Construction work includes new construction as well as additions, alterations, reconstruction, maintenance, and repairs. Of the total value of construction work of \$500 billion, about \$328 billion (66 percent) involves new construction.

EVALUATION OF RISK AND POTENTIAL BENEFITS

Of the 115,000 injuries due to falls that occur in the construction industry annually, 68,000 are addressed by the subpart M standard while the remaining 47,000 are attributable to circumstances addressed by standards other than subpart M. Injuries and fatalities due to falls in construction that are not covered by subpart M include falls that are not associated with subpart M criteria for fall protection systems (1926.502) and involve ladders, stairs, scaffolds, vehicles, and skeletal steel erection of buildings. Similarly, of the 158 fatalities due to

falls in construction annually, 95 are covered by provisions of the revised subpart M standard.

Revisions to subpart M promulgated through this rulemaking are expected to result in the prevention of 22 fatalities and 15,600 injuries annually in addition to the fatalities and injuries that would be prevented through full compliance with the existing standard. Most of the falls in construction addressed by subpart M could be prevented through compliance with the existing as well as with the revised standards.

In addition to unquantifiable reductions in pain and suffering, the prevention of injuries will result in estimated savings of over \$200 million annually. This estimate includes savings related to wage and productivity losses, medical costs, administrative expenses, and other costs associated with accidents.

TECHNOLOGICAL FEASIBILITY

Since the requirements of revised subpart M can be met with existing equipment and methods, the standard is considered technologically feasible.

COSTS

The total estimated costs associated with new requirements included in revised subpart M amount to about \$40 million annually. The majority of these costs (\$25 million) involve costs associated with providing increased fall protection for

employees working on roofs. Other components of the estimated compliance costs involve inspections and tests of personnel safety nets (\$5.4 million), and additional training for employees exposed to fall hazards (\$6.6 million).

ECONOMIC IMPACTS

Compliance with the requirements of revised subpart M has been determined to be economically feasible and is not expected to produce any significant adverse economic impacts. The costs that are imposed by the regulation should be a minimal burden on construction establishments. The estimated compliance costs represent less than 0.01 percent of total construction revenues and less than 0.5 percent of revenues for each individual construction sector.

REGULATORY FLEXIBILITY ANALYSIS

Pursuant to the Regulatory Flexibility Act, OSHA has made an assessment of the impact of the revised standard and has concluded that it would not have a significant impact upon a substantial number of small entities. The estimated compliance costs do not involve large capital expenditures, and there is no significant differential effect on small firms relative to that on large firms.

II. INDUSTRY PROFILE

The revised subpart M standard applies to all establishments in the construction industry. The 1987 Standard Industrial Classification (SIC) manual divides the construction industry into three broad types of activities: building construction general contractors (SIC 15), heavy construction general contractors and special trade contractors (SIC 16), and construction by other special trade contractors (SIC 17).

Building construction can be subdivided into residential building construction and nonresidential building construction. Residential buildings include single-family homes, townhouses, apartment buildings, hotels, and motels. Nonresidential building construction involves the construction of office buildings, industrial buildings, religious buildings, educational buildings, hospitals, recreational buildings, and other buildings. The numbers of employees and establishments, and the corresponding value of construction work, are presented for SIC 15 in Tables II-1 and II-2.

Heavy construction includes the construction of highways and streets, as well as bridges, tunnels, and elevated highways. In addition, heavy construction includes the construction of diverse facilities such as recreational facilities, harbor and port facilities, power and communication lines, sewers and water mains, blast furnaces, mass transit systems, and oil fields. The numbers of employees and establishments, and the corresponding value of

TABLE II-1
RESIDENTIAL CONSTRUCTION
(GENERAL CONTRACTORS AND OPERATIVE BUILDERS)

	SIC 1521 (1)	SIC 1522 (2)	SIC 1531 (3)
NUMBER OF ESTABLISHMENTS	90,378	8,143	20,766
TOTAL EMPLOYEES	396,291	81,708	168,940
CONSTRUCTION WORKERS	307,305	61,245	76,105
CONSTRUCTION WORKER HOURS (THOUSANDS)	470,499	98,455	135,927
NET VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS) (4)	27,319,239	6,257,443	26,837,792
TOTAL VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS)	39,098,146	13,315,544	48,959,809
SINGLE-FAMILY HOUSES	31,833,307	793,845	42,401,837
APARTMENT BUILDINGS	638,197	6,337,325	3,174,608
OTHER RESIDENTIAL	345,309	3,498,516	152,609
OTHER CONSTRUCTION	6,281,333	2,685,858	3,230,755

(1) General Contractors - Single Family Houses

(2) General Contractors - Residential Buildings Other Than Single-Family

(3) Operative Builders

(4) Excludes value of work subcontracted.

Source: Office of Regulatory Analysis, OSHA, U.S. Department of Labor,
based on 1987 Census of Construction,
U.S. Department of Commerce, March 1990.

TABLE II-2
NONRESIDENTIAL BUILDING CONSTRUCTION
(GENERAL CONTRACTORS)

	SIC 1541 (1)	SIC 1542 (2)
NUMBER OF ESTABLISHMENTS	7,014	31,337
TOTAL EMPLOYEES	143,001	488,480
CONSTRUCTION WORKERS	110,785	342,442
CONSTRUCTION WORKER HOURS (THOUSANDS)	195,425	633,554
NET VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS) (3)	11,094,502	39,510,241
TOTAL VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS)	21,461,568	89,793,431
OFFICE BUILDINGS	1,688,344	26,438,662
OTHER COMMERCIAL BUILDINGS	1,098,192	20,503,267
INDUSTRIAL BUILDINGS	15,777,425	7,243,757
RELIGIOUS BUILDINGS	0	1,975,064
EDUCATIONAL BUILDINGS	358,045	8,048,930
HOSPITALS	440,284	9,935,109
OTHER CONSTRUCTION	2,099,278	15,648,642

(1) General Contractors - Industrial Buildings and Warehouses

(2) General Contractors - Nonresidential Buildings, Other Than SIC 1541

(3) Excludes value of work subcontracted.

Source: Office of Regulatory Analysis, OSHA, U.S. Department of Labor,
based on 1987 Census of Construction,
U.S. Department of Commerce, March 1990.

value of construction work, are presented for SIC 16 in Tables II-3 and II-4.

Special trade contractors may work for general contractors in building construction or heavy construction, or may work directly for the owner of a construction project. Special trade contractors include plumbing, heating, and air conditioning contractors, painting contractors, electrical contractors, carpentry contractors, roofing contractors, and a host of other types of contractors with specialized skills. Tables II-5 through II-7 present data on the numbers of employees and establishments and the value of construction work for different categories of special trade contractors.

An overview of the construction industry is presented in Table II-8 by type of construction project. Of the total value of construction work of \$500 billion, about 25 percent (\$124 billion) involves the construction of single family houses. The total value of building construction of over \$370 billion represents about 75 percent of the total value of construction work. Of the \$106 billion worth of nonbuilding construction, about \$45 billion involves the construction of highways, streets, parking areas, bridges, and tunnels; another \$13 billion involves the construction of sewers and water mains.

Construction work includes new construction as well as additions, alterations, reconstruction, maintenance, and repairs. Of the total value of construction work of \$500 billion, about \$328 billion (66 percent) involves new construction.

TABLE II-3
HIGHWAY AND STREET CONSTRUCTION,
EXCEPT ELEVATED HIGHWAYS

	SIC 1611 (1)
NUMBER OF ESTABLISHMENTS	10,986
TOTAL EMPLOYEES	284,380
CONSTRUCTION WORKERS	239,111
CONSTRUCTION WORKER HOURS (THOUSANDS)	439,016
NET VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS) (2)	27,983,839
TOTAL VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS)	34,161,427
HIGHWAYS, STREETS	28,123,431
PARKING AREAS	607,665
RECREATIONAL FACILITIES	183,363
BRIDGES AND TUNNELS	1,152,276
DAMS AND RESEVOIRS	185,273
MARINE CONSTRUCTION	88,785
SEWERS AND WATER MAINS	1,112,314
POWER PLANTS	177,092
OTHER CONSTRUCTION	2,531,228

(1) Highway and Street Construction, Except Elevated Highways

(2) Excludes value of work subcontracted.

Source: Office of Regulatory Analysis, OSHA, U.S. Department of Labor,
based on 1987 Census of Construction,
U.S. Department of Commerce, March 1990.

TABLE II-4
HEAVY CONSTRUCTION, EXCEPT HIGHWAY
AND STREET CONSTRUCTION

	SIC 1622 (1)	SIC 1623 (2)	SIC 1629 (3)
NUMBER OF ESTABLISHMENTS	1,159	9,919	14,532
TOTAL EMPLOYEES	47,494	197,632	297,618
CONSTRUCTION WORKERS	40,092	165,879	238,204
CONSTRUCTION WORKER HOURS (THOUSANDS)	76,210	309,168	420,660
NET VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS) (4)	4,186,846	15,055,297	21,209,274
TOTAL VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS)	5,480,936	17,010,019	25,632,969
BRIDGES AND TUNNELS	4,476,501	127,899	532,104
MARINE CONSTRUCTION	29,291	0	1,379,611
POWER AND COMMUNICATION LINES	0	3,473,127	274,727
SEWERS AND WATER MAINS	93,450	8,571,756	980,373
PIPELINES	0	2,598,987	249,086
SEWAGE TREATMENT PLANTS	113,394	329,366	3,138,903
OTHER CONSTRUCTION	768,300	1,908,884	19,078,165

(1) Bridge, Tunnel and Elevated Highway Construction

(2) Water, Sewer, Pipeline, Communications and Power Line Construction

(3) Heavy Construction, Not Elsewhere Classified

(4) Excludes value of work subcontracted.

Source: Office of Regulatory Analysis, OSHA, U.S. Department of Labor,
based on 1987 Census of Construction,
U.S. Department of Commerce, March 1990.

TABLE II-5
SPECIAL TRADE CONTRACTORS
SIC GROUPS 1711-1743

	SIC 1711 (1)	SIC 1721 (2)	SIC 1731 (3)	SIC 1741 (4)	SIC 1742 (5)	SIC 1743 (6)
NUMBER OF ESTABLISHMENTS	69,566	29,867	49,436	23,284	17,809	5,089
TOTAL EMPLOYEES	617,333	169,968	509,309	168,978	253,563	34,420
CONSTRUCTION WORKERS	470,793	145,385	405,961	150,308	217,392	27,908
CONSTRUCTION WORKER HOURS (THOUSANDS)	844,750	223,559	732,100	221,510	350,749	44,916
NET VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS) (*)	44,517,739	7,445,552	34,657,765	8,269,188	15,137,323	2,181,972
TOTAL VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS)	49,503,323	7,953,323	35,838,226	8,714,161	16,426,850	2,271,593
SINGLE-FAMILY HOUSES	11,394,480	1,929,573	4,164,610	2,738,184	4,486,565	852,862
OFFICE BUILDINGS	6,541,994	1,105,840	7,127,066	1,100,895	3,783,203	325,723
INDUSTRIAL BUILDINGS	7,117,202	988,816	6,548,566	1,063,764	1,294,473	113,849
OTHER BUILDING CONSTRUCTION	20,805,493	2,952,507	12,873,331	3,432,954	6,302,394	935,079
NONBUILDING CONSTRUCTION	3,644,154	976,587	5,124,653	378,364	560,215	44,080

(1) Plumbing, Heating and Air Conditioning

(2) Painting and Paper Hanging

(3) Electrical Work

(4) Masonry, Stone Setting, and Other Stone Work

(5) Plastering, Drywall, Acoustical, and Insulation Work

(6) Terrazzo, Tile, Marble, and Mosaic Work

(*) Excludes value of work subcontracted

TABLE II-6
SPECIAL TRADE CONTRACTORS
SIC GROUPS 1751-1781

	SIC 1751 (7)	SIC 1752 (8)	SIC 1761 (9)	SIC 1771 (10)	SIC 1781 (11)
NUMBER OF ESTABLISHMENTS	36,009	8,174	25,673	23,422	3,414
TOTAL EMPLOYEES	190,431	44,579	231,137	218,194	17,598
CONSTRUCTION WORKERS	164,191	34,666	186,916	186,840	13,628
CONSTRUCTION WORKER HOURS (THOUSANDS)	252,984	55,208	293,990	297,487	25,724
NET VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS) (*)	10,038,947	3,371,200	14,182,802	13,853,510	1,299,288
TOTAL VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS)	11,243,863	3,651,435	15,027,806	15,055,670	1,330,056
SINGLE-FAMILY HOUSES	6,024,429	1,327,792	4,000,304	3,402,452	428,005
OFFICE BUILDINGS	815,411	702,996	1,644,814	1,340,326	11,425
INDUSTRIAL BUILDINGS	603,072	149,642	3,370,775	1,458,714	26,704
OTHER BUILDING CONSTRUCTION	3,672,316	1,441,540	5,794,467	3,766,921	253,331
NONBUILDING CONSTRUCTION	128,635	29,465	217,446	5,087,257	610,591
(7) Carpentry Work					
(8) Floor Laying and Other Floor Work, Not Elsewhere Classified					
(9) Roofing, Siding, and Sheet Metal Work					
(10) Concrete Work					
(11) Water Well Drilling					
(*) Excludes value of work subcontracted.					

Source: Office of Regulatory Analysis, OSHA, U.S. Department of Labor.

TABLE II-7
SPECIAL TRADE CONTRACTORS
* SIC GROUPS 1791-1799

	SIC 1791 (12)	SIC 1793 (13)	SIC 1794 (14)	SIC 1795 (15)	SIC 1796 (16)	SIC 1799 (17)
NUMBER OF ESTABLISHMENTS	4,017	4,636	13,422	1,240	3,777	23,198
TOTAL EMPLOYEES	65,348	40,511	95,329	14,109	62,151	176,084
CONSTRUCTION WORKERS	54,729	28,730	79,198	11,686	50,244	141,615
CONSTRUCTION WORKER HOURS (THOUSANDS)	89,851	49,500	137,093	17,545	91,269	221,784
NET VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS) (*)	4,510,231	3,142,354	7,490,988	844,714	5,009,764	9,832,759
TOTAL VALUE OF CONSTRUCTION WORK (THOUSANDS OF DOLLARS)	4,862,655	3,222,472	8,244,398	912,484	5,359,826	10,814,313
SINGLE-FAMILY HOUSES	68,448	396,351	2,112,521	60,203	45,557	767,914
OFFICE BUILDINGS	930,225	927,580	658,168	92,140	1,356,025	937,438
INDUSTRIAL BUILDINGS	1,173,121	206,157	611,783	155,531	1,565,427	834,379
OTHER BUILDING CONSTRUCTION	1,664,693	1,650,389	3,171,494	401,178	1,937,399	4,110,221
NONBUILDING CONSTRUCTION	1,026,168	41,995	1,690,432	203,432	455,418	4,164,361

(12) Structural Steel Erection

(13) Glass and Glazing Work

(14) Excavation Work

(15) Wrecking and Demolition Work

(16) Installation or Erection of Building Equipment, Not Elsewhere Classified

(17) Special Trade Contractors, Not Elsewhere Classified

(*) Excludes value of work subcontracted.

Source: Office of Regulatory Analysis, OSIIA, U.S. Department of Labor.

TABLE II-8

VALUE OF CONSTRUCTION BY TYPE OF PROJECT

Type of Project	Value of Construction (thousands of dollars)	
Building Construction	\$373,421,764	
Single family houses		124,339,120
Apartment buildings		22,262,613
Other residential		14,475,450
Office buildings		60,723,297
Other commercial buildings		46,370,994
Industrial buildings		52,584,685
Religious buildings		4,535,939
Educational buildings		16,282,387
Hospital buildings		19,305,021
Farm buildings		1,560,486
Amusement, social buildings		3,046,690
Other buildings		3,995,887
Land development		3,939,195
Nonbuilding Construction	105,648,260	
Highways, streets		33,692,504
Parking areas, fencing		4,665,769
Recreational facilities		1,114,321
Bridges, tunnels		7,051,964
Dam and reservoir		990,275
Marine construction		1,595,977
Harbor & port facilities		619,269
Conservation/development		1,520,673
Power & communication lines		6,232,816
Sewers, water mains, etc.		13,506,798
Pipe line construction		3,259,867
Mass transit		1,416,178
Blast furnaces, chemical complexes		6,776,004
Power plants		6,915,723
Sewage treatment plants		6,057,721
Oilfields		506,820
Earthmoving, nonbuilding		2,677,903
Other nonbuilding construction		4,564,535
Other construction work	20,912,210	
Total		\$499,982,234

Source: Office of Regulatory Analysis, OSHA; based on U.S. Department of Commerce, 1987 Census of Construction.

III. BENEFITS

INTRODUCTION

Construction workers confront potential fall hazards due to the nature of their work and of the work environment. Much work is done at heights and the work surface is often temporary. Construction work often involves structures that are incomplete or unfinished. Also, work is frequently done in areas that are not designed for regular use by employees.

Safety professionals collaborated in developing consensus standards for fall protection and construction employers voluntarily followed those standards prior to the establishment of OSHA. This voluntary action indicated a general agreement (even without specific fatality and injury data) that work at elevations in the construction industry was hazardous. In 1971, pursuant to section 6(a) of the Occupational Safety and Health Act, OSHA adopted industry consensus standards on open-sided floors, floor and wall openings, and roof perimeters under subpart M of 29 CFR Part 1926 (36 FR 10466).

While compliance with the existing standards has reduced the number of injuries and fatalities to workers, the continuing occurrence of serious accidents associated with falls in construction demonstrates a need to revise these standards. This chapter presents available accident data regarding falls in order to determine the potential benefits associated with the revision of subpart M.

DATA SOURCES

One difficulty in determining the extent of the risk associated with falls addressed by subpart M is that there is no single data source that directly reports the total number of construction workers who are injured or killed as a consequence of a fall. Thus, OSHA has had to estimate the number of these accidents by combining several different data sources. These data sources include the Bureau of Labor Statistics (BLS) Occupational Injuries and Illnesses in the United States by Industry, 1991 (OII), published in May 1993; data from the BLS Supplementary Data System (SDS) Microdata Files, 1987 Edition (issued by BLS in October 1989); data from OSHA's IMIS database; and the 1987 Census of Construction Industries issued by the U.S. Department of Commerce, Bureau of the Census, in March 1990. In addition, public comments in response to proposed subpart M and the accompanying Preliminary Regulatory Impact Analysis (PRIA), as well as other evidence submitted for the record, were considered in the assessment of risk.

EVALUATION OF RISK

Using the employment level reported by the Bureau of the Census, OSHA estimates that there are approximately 5 million employees in the construction industry. Of these, about 4 million are construction workers. Although it is quite likely that the frequency of exposure to fall hazards differs among construction

trades, the available data are not sufficiently detailed for any such differences to be quantified.

Although individual estimates of the risks of a fall for specific groups of construction workers are not available, certain situations can be identified where fall hazards are more prevalent. For example, workers on roofs without appropriate fall protection would be continuously exposed to the unprotected edges and thus would be more likely to be at significant risk of falling. Carpenters on unfinished floors and bricklayers constructing walls may also be at a significant risk if adequate fall protection is not provided or used.

The Bureau of Labor Statistics (BLS) published a profile of the safety and health of employees engaged in roofing and sheet metal work (Monthly Labor Review, September 1990). These employees were found to have the highest rate of occupational injuries and illnesses in the construction industry. The 1988 incidence rate of almost 20 occupational injuries and illnesses per 100 full-time workers in roofing and sheet metal work was 35 percent higher than the rate for all construction (the most hazardous major industry grouping) and more than twice the rate for private industry as a whole.

In addition, the average severity of the injuries was worse than the average severity of injuries in the construction industry and in the private sector as a whole. The annual rates of 11 lost workday cases and 240 lost workdays per 100 full-time workers are over 60 percent higher than the corresponding rates for the

construction industry as a whole. The leading cause of injuries among roofing workers is falls. Table III-1 categorizes construction occupations by their potential for exposure to falls.

For purposes of this analysis, fatalities and injuries associated with skeletal steel erection of buildings are not included in the estimates associated with the revised subpart M standard; these incidents are generally not covered by the subpart M standard. OSHA is in the process of developing a separate standard (subpart R of 29 CFR Part 1926) which would cover the activities involved in steel erection.

NUMBER OF INJURIES AND FATALITIES ASSOCIATED WITH FALLS

Background

OSHA relied upon the OII and the SDS data sources to estimate the frequency of injuries and fatalities associated with falls in construction. The OII data source is based upon a BLS extrapolation of company data reported in the annual survey of occupational injuries and illnesses. The SDS is based upon information collected from State Workers' Compensation claims that are voluntarily reported by the states to OSHA. In 1987, 25 states participated in this collection effort.

Despite some limitations related to lack of uniformity in reporting and only partial coverage among the 50 states, the SDS data are useful in estimating the percentages of specific types of occupational injuries and, in particular, the percentages of construction injuries that are due to falls. OSHA believes that

TABLE III-1
 NUMBER OF CONSTRUCTION WORKERS
 BY OCCUPATION AND DEGREE OF EXPOSURE TO FALLS

OCCUPATIONAL CATEGORY	NUMBER OF WORKERS (THOUSANDS)
<u>High exposure</u>	
Carpenters	1,181
Brickmasons and stonemasons	189
Insulation workers	55
Roofers	154
Structural metal workers ¹	54
<u>Medium exposure</u>	
Electricians	605
Painters, construction and maintenance	468
Construction laborers	651
Plumbers, pipefitters and steamfitters	393
<u>Low exposure</u>	
Tile setters	49
Drywall installers	134
Concrete and terrazzo finishers	66

¹ Skeletal structural steel erection of buildings is not covered by section 1926.501 in revised Subpart M.

Source: Office of Regulatory Analysis, OSHA,
 U.S. Department of Labor.

the percentages from the SDS can be used to represent national percentages, and has applied these percentages to the total number of occupational injuries in construction reported by BLS in the OII to establish the total number of construction injuries that are due to falls.

Risk of Injury

BLS reports in the OII that there were approximately 519,300 total cases of injury and illness in the construction industry in 1991. This is down from an estimated 638,100 total cases estimated for 1990. The SDS data indicate that of all reported injuries and illnesses in construction in 1987, approximately 22.2 percent were due to falls. Thus, using the figures for total cases for 1991, the total annual number of injuries due to falls in the construction industry is estimated to be 115,000.

Some specific types of falls are covered by other OSHA standards and thus should be excluded from this analysis which focuses on the impacts of the revised subpart M standard only. Estimates of the numbers of these falls have been developed in regulatory impact analyses for other relevant standards (such as subpart X, Stairways and Ladders, and subpart L, Scaffolds). In addition, the SDS data give a limited distribution of the type of falls reported in construction.

Of the total number of construction injury and illness cases, 3.2 percent were due to falls from ladders and 0.6 percent were due to falls on stairs; these are addressed by the new subpart X of 29

CFR Part 1926. In addition, 3.0 percent of the total cases were falls from scaffolds which are addressed in subpart L; and 1.5 percent of the total cases were falls from vehicles which are addressed in subparts N and O. Together, these falls account for about 43,000 injuries annually. Finally, of the remaining injuries due to falls in construction, about 4,000 are estimated to occur annually in steel erection activities which are covered by subpart R. Thus, the estimated annual number of injuries due to falls in construction addressed by the revised subpart M is 68,000. This breakdown is summarized in Table III-2 and is also illustrated by Figure III-1.

The estimated number of construction injuries due to falls includes both lost workday injuries and non-lost workday injuries. In order to estimate the aggregate number of lost workdays associated with these falls, OSHA assumed, in the absence of other data, that the percentage of falls resulting in a lost workday injury is the same as the percentage of injuries from all causes in construction resulting in lost workdays.

BLS reported that of all occupational injuries in construction, approximately 47 percent were lost workday injuries and 53 percent were non-lost workday injuries. Using the above estimate of 68,000 injuries as the annual number of construction injuries due to falls covered by subpart M, the annual number of lost workday injuries due to falls is 32,000.

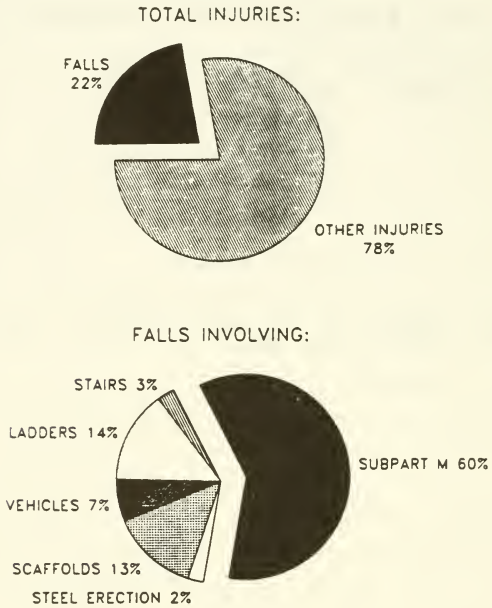
In order to estimate the number of lost workdays due to these injuries, OSHA assumed that the average number of lost workdays due

TABLE III-2
FALLS IN CONSTRUCTION

TOTAL ANNUAL INJURIES AND ILLNESSES IN CONSTRUCTION:	519,300
TOTAL INJURIES DUE TO FALLS:	115,000
FALLS NOT COVERED BY SUBPART M:	
Involving:	
Ladders	16,600
Stairs	3,100
Scaffolds	15,600
Vehicles	7,800
Steel erection	<u>4,000</u>
Total	47,000
TOTAL INJURIES ADDRESSED BY SUBPART M	68,000

Source: Office of Regulatory Analysis, OSHA, U.S.
Department of Labor.

FIGURE III-1
INJURIES IN CONSTRUCTION



Source: Office of Regulatory Analysis, OSHA,
U.S. Department of Labor.

to a fall in construction would equal the average number of lost workdays from all lost workday injuries in construction. This assumption is based on the nature of injuries typically associated with falls in construction. Such injuries tend to involve a relatively high proportion of fractures (indicating a relatively high degree of severity) and are generally comparable in severity to injuries in construction due to other causes. Thus, it can be expected that the average number of lost workdays resulting from a lost workday injury due to a fall would be at least as great as the average number of lost workdays resulting from all lost workday injuries in construction.

BLS reported that an average of 24.4 lost workdays were associated with each lost workday injury in the construction industry. OSHA, therefore, estimated that the annual number of lost workdays in construction due to falls (excluding those covered by standards other than subpart M) is 780,000. The numbers of injuries and lost workdays addressed by subpart M are summarized in Table III-3.

Risk of Fatality

OSHA also examined the available data on construction fatalities due to falls. BLS and Census data indicate that an average of 750 fatalities occur annually among employees in the construction industry. Furthermore, in the BLS OII publication, 21 percent of these fatalities were reported to be due to falls. As with injuries due to falls, almost 40 percent of the fatalities

TABLE III-3
ANNUAL INJURIES AND FATALITIES ADDRESSED BY SUBPART M

INJURIES ADDRESSED BY SUBPART M	68,000
LOST WORKDAY INJURIES	32,000
NON-LOST WORKDAY INJURIES	36,000
LOST WORKDAYS	780,000
TOTAL FATALITIES IN CONSTRUCTION	750
FATALITIES DUE TO FALLS (21% OF TOTAL)	158
OF WHICH 40% ARE NOT ADDRESSED BY SUBPART M (INVOLVING LADDERS, STAIRS, SCAFFOLDS, VEHICLES, STEEL ERECTION)	63
FATALITIES ADDRESSED BY SUBPART M	95

Source: Office of Regulatory Analysis, OSHA, U.S.
Department of Labor.

due to falls can be attributed to activities not covered by subpart M. As a result, the estimated annual number fatalities due to falls covered by this standard is 95, as presented in Table III-3.

The data in the OII and SDS do not give sufficient detail to further categorize these fatalities. A better understanding of the nature of some of these accidents can be derived from information in OSHA's IMIS database. This database includes abstracts from fatality/catastrophe (FATCAT) investigations performed by OSHA which describe the circumstances involved in an accident. These investigations are initiated when a fatality or a catastrophe (defined as an accident requiring the hospitalization of at least five employees) is reported to OSHA. Not all states participate in this federal OSHA program and thus not all occupational fatalities are recorded in FATCAT reports.

For the fifteen month period ending in March 1990, thirty accidents related to falls in construction were included in the IMIS database. The abstracts often do not reveal where an employee fell from or what he may have been doing at the time of the fall. The diversity of the circumstances makes the development of a systematic method of classification difficult; nevertheless, the anecdotal information provides useful insight into the nature of such accidents.

The most common type of accident involved an unprotected side or edge where no guardrail or safety net was present and the employee was not tied off. Several accidents involved falling

through an opening or hole that was not adequately guarded or covered. Fatalities related to roofing work included both falls from roofs to the ground and falls through roof areas that could not adequately support employees, such as skylights or layers of insulation. Some falls occurred as a result of poorly constructed work surfaces, some occurred while a lanyard was temporarily detached, and sometimes there was no apparent reason for the fall.

There are a large number of diverse and unique work stations in construction that can involve fall hazards. Compliance with the performance-oriented rules incorporated in revised subpart M can ensure safety even in unanticipated circumstances, because the rule addresses the fundamental aspects of the hazard and allows for flexibility in providing protection.

BENEFITS ACHIEVABLE THROUGH COMPLIANCE WITH SUBPART M

The lives saved and injuries and illnesses prevented by the promulgation or revision of a standard are the primary benefits of the standard. In order to evaluate the benefits associated with the revision of subpart M, OSHA examined the potential effectiveness of the revised standard and of the existing standard. That is, the number of fatalities and injuries that would be prevented by full compliance with each standard was estimated. A baseline of current industry practices was used.

Table III-4 presents estimates of the number of fatalities, injuries, and lost workdays potentially preventable each year through full compliance with the existing and revised standards.

TABLE III-4

ANNUAL FATALITIES AND INJURIES ASSOCIATED WITH FALLS
PREVENTABLE BY FULL COMPLIANCE WITH THE
REVISED AND EXISTING STANDARDS

Nature of Accident	<u>Number of Accidents Prevented Annually</u>		
	Revised Subpart M	Existing Subpart M	Difference
Fatalities	79	57	22
Injuries			
Lost Workday	26,600	19,200	7,400
Non-Lost Workday	29,800	21,600	8,200
Total	56,400	40,800	15,600
Lost Workdays	650,000	470,000	180,000

Source: U.S. Department of Labor, OSHA, Office of Regulatory Analysis.

As reported in the Preliminary Regulatory Impact Analysis for the proposed subpart M standard, Arthur Young investigated the OSHA fatality/catastrophe abstracts concerning falls in construction and estimated the percentage of these fatalities and injuries that would have been prevented under full compliance with the proposed standard and under full compliance with the existing standard. Arthur Young concluded that full compliance with the proposed standard would have prevented approximately 83 percent of the fatalities and injuries associated with falls whereas full compliance with the existing standard would have prevented approximately 72 percent of the fatalities and injuries associated with falls.

A review of more recent accident data from OSHA's IMIS database indicates that the percentage of accidents that could be prevented with full compliance would be 83 for the revised standard and 48 for the existing standard. These estimates are based on abstracts found in OSHA's IMIS database involving falls in construction during the fifteen month period ending with March, 1990. The lower relative effectiveness of the existing standard as estimated from the 1989-1990 data primarily reflects the relatively higher proportion of the accidents that are associated with falls from roofs. Such falls are not as effectively addressed by the existing standard.

In reconciling the two sets of estimates OSHA believes that full compliance with the revised standard would prevent 83 percent and full compliance with the existing standard would prevent 60

percent of the fatalities and injuries due to falls in construction covered by subpart M. (Sixty percent represents the average of 48 and 72 percent effectiveness rates noted above.)

OSHA considers these estimates to be appropriate for use in this analysis for two reasons. First, comments from the public in response to the preliminary analysis, data submitted to the docket, and other evidence in the record, are consistent with these estimates. Second, a review of articles and other literature as well as anecdotal information about experiences in construction confirm that these estimates give a reasonable representation of the relative effectiveness of the standards.

Most of the falls in construction addressed by subpart M could be prevented through compliance with the existing as well as with the revised standards. Situations where one working surface is six or more feet above an adjacent surface are as diverse as they are prevalent in construction environments. By far the most frequently cited violation to subpart M requirements is a failure to properly protect workers from falling at least six feet to a lower level. A typical accident would involve a worker falling from a work surface that should have been equipped with a guardrail at the perimeter. Also, many accidents occur as a result of holes or openings, such as skylights, being left improperly covered or inadequately guarded.

A major difference between the revised standard and the existing standards (as interpreted in the case law developed by the review commission) is the extent of fall protection required for

work on roofs. Under the existing standard, positive fall protection is not explicitly required except in very limited circumstances. The revised standard requires a more widespread use of guardrails, safety nets, or personal fall arrest systems. Many injuries and fatalities could have been prevented through the use of such systems. Based on reviews of IMIS abstracts, an estimated 10 to 30 percent of the accidents addressed by this standard involve falls from roofs.

Unlike the existing subpart M, the revised standard explicitly provides for the use of personal fall arrest systems, safety nets, or guardrails to protect against falls of six feet or more. Such protection is frequently offered already in situations where workers are exposed to falls. Full compliance with the revised standard will involve an increased use of personal fall arrest systems. This, in turn, will further reduce the number of injuries and fatalities due to falls in construction. The use of personal fall arrest systems should also be accompanied by the training necessary to ensure that safe work practices are followed. These provisions will help reduce accidents that result from unsafe work procedures.

OSHA determined that, on an annual basis, full compliance with all of the requirements of the revised standard (including existing requirements retained in the new regulation) will prevent 79 fatalities; 56,400 injuries, of which 26,600 would be lost workday injuries and 29,800 would be non-lost workday injuries; and 650,000 lost workdays (see Table III-4).

Similarly, OSHA determined that full compliance with the existing standard would prevent 57 fatalities; 40,800 injuries, of which 19,200 would be lost workday injuries and 21,600 would be non-lost workday injuries; and 470,000 lost workdays annually (see Table III-4).

Accordingly, the Agency has concluded that the revised standard will be more protective than the existing standard. That is, 22 more fatalities and 15,600 more injuries (7,400 lost workday injuries and 8,200 non-lost workday injuries) would be prevented, and 180,000 fewer work days would be lost annually after implementation of the revised standard (see Table III-4).

REFERENCES

1. U.S. Department of Labor. Occupational Injuries and Illnesses in the United States by Industry, 1991. Washington, D.C.: Bureau of Labor Statistics, May 1993.
2. U.S. Department of Labor. Supplementary Data System Microdata Files, 1987 Edition, Washington, D.C.: Bureau of Labor Statistics, October, 1989.
3. Preliminary Regulatory Impact and Regulatory Flexibility Assessment of Subpart X - Stairways and Ladders (29 CFR Part 1926.1050-1060). OSHA, Office of Regulatory Analysis, Washington, D.C., 1985.
4. U.S. Department of Commerce. Census Bureau. 1987 Census of Construction Industries. Washington, D.C., March, 1990.
5. Preliminary Regulatory Impact and Regulatory Flexibility Assessment of Subpart M - Fall Protection (29 CFR Part 1926.500-503). OSHA, Office of Regulatory Analysis, Washington, D.C., 1985.

IV. TECHNOLOGICAL FEASIBILITY

Since the requirements of revised subpart M can be met with existing equipment and methods, the standard is considered technologically feasible. This section provides a discussion of the technological feasibility of complying with specific requirements in the revised standard.

The provisions of the revised standard can be divided into three broad groups: requirements to use fall protection systems, performance requirements for different types of fall protection systems, and requirements involving employee training and work practices associated with the use of fall protection systems.

Section 1926.501 sets forth requirements to provide fall protection. The requirements are performance-oriented, allowing the employer to choose a particular approach depending on the workplace circumstances. Employees on working surfaces with sides and edges six feet or more above lower levels can usually be protected from the fall hazards through the use of a guardrail system, which may be permanent or temporary. Different types of guardrail systems are available and can be adapted to a variety of different situations.

In some cases the use of a guardrail system (or other specific type of fall protection system) to protect employees from falls may be inappropriate. Employers would then use one of the other means of providing fall protection, including guardrails, personal fall arrest systems or safety net systems. The diversity of products and methods available for providing

positive fall protection means that employers will generally be able to protect employees from fall hazards using guardrails, personal fall arrest systems, safety nets, or some combination of these systems. These systems can be adapted to virtually any situation. The performance-oriented nature of the requirements allows customized systems to be tailored to specific or unique circumstances of different projects.

Employees can be protected from falls most effectively by eliminating exposures to fall hazards. Some employers will find that planning ahead enables them to implement alternative construction methods and work practices that eliminate or reduce exposure to fall hazards.

For example, work may be performed on building components or components may be assembled at ground level before they are elevated. Anchorage points or cables can be installed into building components so that subsequent needs for tying off can be met quickly and easily. Manlifts, ladders, platforms, or walkways can be utilized for access to elevated work places.

Providing positive fall protection (combinations of guardrail systems, safety net systems, and/or personal fall arrest systems) for employees working at elevations is not a new concept. Many construction employers have adopted a 100 percent fall protection policy; the State of Washington has required 100 percent fall protection for years. OSHA has consistently enforced requirements to protect employees from fall hazards. The extensive record developed for this rulemaking through the

participation of public and private organizations and affected employers and employees indicates that employees can be feasibly protected from potential fall hazards during all types of construction activities, as required by revised subpart M.

Revised subpart M includes provisions which address specific activities or circumstances with regard to fall protection. For example, employers who have employees constructing leading edges, precast concrete structures, or residential structures, and can demonstrate that the use of guardrail systems, personal fall arrest systems, or safety net systems is infeasible, or would create a greater hazard, shall implement fall protection plans which comply with 1926.502(k). A fall protection plan involves careful planning of construction work to maximize employers' ability to provide protection from potential fall hazards; documentation of the rationale for any determination that fall protection cannot be provided or that providing it would pose a greater hazard; and implementation of controlled access zones and safety monitoring systems. The practices required by paragraph (k) are currently available and used in the construction industry, and do not involve technological feasibility problems.

Requirements in revised subpart M for protecting employees from falling into or through holes in floors and other surfaces are basically unchanged from existing requirements. The technology involved consists of standard guardrail systems, personal fall arrest systems, or covers. The requirements are performance-oriented and provide employers with the flexibility

to choose among options which adequately protect employees from fall hazards without unduly restricting the performance of work. No technological feasibility problems have been identified with the application of these systems.

The revised standard includes requirements specifically addressing fall hazards involving employees on formwork or reinforcing steel. The revised requirements clarify and increase the flexibility of the existing requirements, such as those in section 1926.701(f), by increasing the number of fall protection options available to employers. Technological feasibility has not been a problem in complying with the existing requirements, and thus OSHA believes that the revised requirements are also technologically feasible.

Ramps, runways, and other walkways six feet or more above lower levels are required to have guardrail systems under the revised standard. These walking or working surfaces are commonly available and used with guardrails attached. Guardrail systems that can be installed onto existing ramps and other such surfaces are also available commercially. In addition, guardrails can be constructed and added to walkways at a worksite as necessary.

Requirements in the revised standard pertaining to excavations are similar to existing requirements contained in subpart P (section 1926.651). Employees near the edges of wells, pits, shafts, and similar excavations six feet or more in depth are required to be protected by any one of several methods, all

of which are commonly available and presently used in the construction industry.

Revised subpart M retains the requirement in existing 1926.500(d) concerning fall protection for employees above dangerous equipment. The revised standard provides additional options for employers to protect employees in such situations. The Agency has determined that compliance will not pose technological feasibility problems.

Overhand bricklaying and related work is specifically addressed by the revised standard. The revised standard provides additional flexibility for protecting employees during this type of work. Employees not reaching more than ten inches below the level of the surface on which they are working may work in a controlled access zone. The use of personal fall arrest systems during this type of work would also be technologically feasible. For employees involved in bricklaying and related activities, compliance with the available choices given for protection from fall hazards do not present any technological feasibility problems.

Fall protection requirements in revised subpart M for employees working on roofs are more comprehensive than existing requirements. Generally, employees on low-slope roofs with unprotected sides and edges six feet or more above lower levels are required to be protected by guardrail systems, personal fall arrest systems, or safety net systems. The revised standard provides additional options for employers to protect employees

engaged in roofing activities on low-slope roofs. In that case, employees may be protected by a combination of warning line system and safety monitoring system, or in some cases, by a safety monitoring system alone.

The installation of guardrails along the perimeter of low-slope roofs to protect employees from fall hazards would generally not present any technological feasibility problems. Employers may also choose among many different types of personal fall arrest systems that are readily available. A personal fall arrest system, including the use of retractable lifelines or horizontal cable systems, can be applied to virtually any situation involving fall hazards, including roofs. The use of safety net systems may represent yet another technologically feasible option to protect employees on roofs.

Employers are likely to choose among feasible fall protection systems based on the circumstances of each particular job, including the duration of the work, the number of employees involved, and the cost of each system. Technological feasibility would generally not be considered a constraint in providing some type of positive fall protection for all employees on roofs.

For precast concrete erection and the construction of leading edges, the revised subpart M standard requires employers to develop and implement a fall protection plan if the use of conventional fall protection systems is infeasible or would create a greater hazard. OSHA believes that it is feasible for employers to provide employees with positive fall protection

during all precast concrete erection and leading edge construction activities. The fall protection plan is a performance-oriented additional option which involves the use of controlled access zones and work practices to minimize employee exposure to potential fall hazards. Specific work practices are not mandated by the revised standard, and no problems regarding technological feasibility are involved for compliance with these provisions.

For residential construction activities, the revised subpart M standard provides additional flexibility in protecting employees from fall hazards. OSHA believes that it is feasible to protect employees from potential fall hazards in all residential construction activities through the use of positive fall protection systems. Where the use of such fall protection or fall arrest systems may be infeasible or would create a greater hazard, the employer is required, as part of a fall protection plan, to implement work practices which reduce employee exposures to potential fall hazards. Appropriate work practices may vary and be tailored to conditions at each particular worksite. Technological feasibility is not an issue for compliance with this provision.

Existing OSHA standards pertaining to work on steep roofs (such as section 1926.451(u)) require the use of guardrail systems or personal fall arrest systems where the ground to eave height is over sixteen feet. Revised subpart M increases flexibility for employers in protecting employees from fall

hazards in these situations by allowing additional fall protection methods to be used. Increasing flexibility for employers does not involve technological feasibility problems.

Revised subpart M requires fall protection for all employees working on steep roofs at six feet or more above lower levels. The available fall protection options for steep roofs with fall hazards greater than sixteen feet will also be technologically feasible for use on steep roofs between six and sixteen feet above lower levels. Many types of guardrail systems and personal fall arrest systems are designed for or can be applied to work on steep roofs. The technology involved consists of readily available and commonly used construction materials and equipment for constructing guardrails, and a wide variety of commercially available and commonly used personal fall arrest systems involving basic components such as lanyards, harnesses, lifelines, and anchorage brackets.

Requirements regarding wall openings in the revised standard are similar to those in existing standards. Whereas the existing standards require fall protection for wall openings with a potential fall greater than four feet, the revised standard requires fall protection for potential falls of six feet or more. No problems regarding technological feasibility have arisen.

Under revised subpart M, employers are required to protect employees from potential hazards of falling objects. Several options are provided in the standard to achieve the necessary

protection in a performance-oriented manner. No technological feasibility constraints are associated with these requirements.

Requirements in revised subpart M regarding criteria and practices associated with fall protection systems basically codify the existing consensus standards associated with these systems. Commercially available systems generally meet or exceed the requirements of the revised standard.

The specifications for guardrail systems do not present technological feasibility problems. Guardrails of the required height and strength, with openings within the maximum allowed dimensions, and in compliance with other guardrail requirements in revised subpart M, are commercially available and can be built using a variety of different materials, designs, and construction methods.

Specifications for safety net systems provide basic performance-oriented requirements to ensure the effectiveness of these systems for fall protection (e.g., "Defective nets shall not be used."). Safety net systems are currently in use throughout the construction industry that comply with the requirements of the revised standard. Any feasibility problems which may be associated with drop-testing safety net systems at the job site are resolved by allowing employers in such cases the alternative of certifying safety net installations.

Personal fall arrest systems and positioning device systems currently manufactured and in use meet the specifications of revised subpart M. Technology is readily available to design and

produce components and systems complying with the criteria for strength and safety set forth in the revised standard.

Warning line systems, controlled access zones, and safety monitoring systems involve existing technologies that can be applied in a variety of construction environments. No difficulties regarding the technological feasibility of these systems have been identified.

Requirements for covers in the revised standard are performance-oriented; many different technologies are readily available for complying with these requirements.

Appropriate protection from falling objects can be provided in several different ways, each of which involves the application of basic materials or equipment currently available to all employers.

The criteria listed in the revised standard for the fall protection plan and for the training requirements do not involve issues of technological feasibility.

In conclusion, revised subpart M relies on existing technologies and work methods to provide appropriate fall protection for construction employees. The equipment and work practices required by the standard are currently utilized in varying degree throughout the construction industry. In addition, performance requirements for each type of fall protection system are included in the revised standard. These requirements basically codify existing consensus standards and commonly accepted safety criteria, making those provisions legally binding for employers.

V. COSTS OF COMPLIANCE

Background

The requirements of revised subpart M are to a large extent already imposed by existing subpart M and other construction standards. Changes and improvements that would result from the promulgation of revised subpart M include a reorganization and rewording of provisions for increased clarity and a more straightforward, comprehensive coverage of construction fall hazards.

Some of the existing subpart M requirements were derived from ANSI standards and adopted by OSHA under section 6(a) rulemaking shortly after the creation of the Agency. These consensus standards included detailed specifications for safe construction and work on certain surfaces. Because they were originally conceived as guidelines, they are not necessarily applicable to every situation and not all circumstances are explicitly addressed.

As a result, some details of the functional requirements of existing subpart M have been developed through a history of enforcement procedures, appeal decisions, and individual variance grants. While employers' obligations under existing subpart M have provided a general minimum level of safety, these obligations are more clearly and comprehensively delineated in the revised standard. There are provisions in revised subpart M which also represent substantive changes from existing requirements. This chapter outlines the compliance costs

associated with these changes and with the revised standard as a whole.

Data Sources

An initial methodology for the development of cost of compliance estimates for existing and proposed subpart M requirements was provided in the Preliminary Regulatory Impact Analysis (PRIA) which was released by OSHA with the publication of the proposed subpart M rule in November, 1986. The PRIA relied largely upon a September 1984 study conducted by Arthur Young and Company for OSHA entitled, "Technological Feasibility and Economic Impact Analysis of Draft Revisions to OSHA Regulations on Walking/Working Surfaces". The Arthur Young study used estimates made by interested and affected parties (e.g., labor unions, industry trade associations, individual construction firms, etc.) and estimates made by the Arthur Young professional staff concerning the draft alternatives to the existing subpart M. OSHA has updated its analysis to more accurately reflect the impact of this rule on more current circumstances. Additional data sources include the Census of Construction Industries, the Statistical Abstract of the United States, OSHA's Integrated Management Information System (IMIS) database, public comments received in response to the proposed rule, and other material submitted to the docket.

Overview of Compliance Costs Associated with Subpart M

Estimates of the total costs of full compliance with provisions of the revised standard are presented in Tables V-1 and V-2. The costs of full compliance with revised subpart M can be divided into two groups: 1) new costs for provisions that would come into effect as a result of the promulgation of the revised standard (shown in Table V-1); and 2) incremental costs of achieving full compliance with existing provisions that would remain in effect under revised subpart M (shown in Table V-2).

Total new costs imposed on the construction industry annually by the regulatory changes would amount to about \$40 million. From a baseline of current industry practices, the estimated total annual costs of reaching full compliance with existing requirements covered in subpart M and retained in the revised standard would be about \$30 million. A discussion of the derivation of the costs for individual provisions follows.

Costs of Compliance with the Revised Standard

An important change in the revised standard involves fall protection during work on roofs. In 1926.500(d) the existing standard addresses the guarding of "open-sided floors, platforms, and runways." Two circuit courts of appeals (Langer Roofing and Sheet Metal, Inc. vs. Secretary of Labor 524 F.2d 1337 [7th Cir. 1975] and Diamond Roofing Co. Inc. vs. Occupational Safety and Health Review Commission, 528 F. 2d 645 [5th Cir., 1976]) have ruled that these perimeter guarding provisions in 1926.500(d) do

TABLE V-1
ANNUAL COSTS OF COMPLIANCE WITH
NEW REQUIREMENTS IN THE
REVISED SUBPART M STANDARD

Provision	Annual Cost in Millions of Dollars
New Subpart M Requirements	
Increased Fall Protection on Roofs	
Safety Lines	18.00
Nets and Guardrails	7.35
Control Zones for Overhand Bricklaying	0.71
Fall Protection from Open-sided Floors and Other Surfaces, Except Guardrails	1.50
Personnel Safety Net Inspections and Tests	5.40
Additional Training	<u>6.56</u>
Total	39.52

Source: U.S. Department of Labor, OSHA, Office of
Regulatory Analysis.

TABLE V-2

ANNUAL COSTS OF ACHIEVING FULL COMPLIANCE WITH
EXISTING REQUIREMENTS RETAINED IN
THE REVISED SUBPART M STANDARD

Provision	Annual Incremental Cost in Millions of dollars
Existing Requirements Without Full Compliance:	
Guardrails for Open-sided Floors and Platforms	21.00
Protection from Floor Holes and Openings	2.10
Miscellaneous Noncompliance	<u>6.92</u>
Total	30.02

Source: U.S. Department of Labor, OSHA, Office of
Regulatory Analysis.

not apply to roofs. However, OSHA has applied other provisions in the Code of Federal Regulations, Part 1926, as well as the general duty clause of the Occupational Safety and Health Act, to protect workers from fall hazards, including those from roofs.

The existing provisions in 1926.500(g) require warning line and safety monitoring systems to be used to protect workers during the performance of built-up roofing work on low-pitched roofs with a ground to eave height greater than 16 feet. The revised standard requires that employees on roofs generally be protected by nets, personal fall arrest systems, or guardrails for fall hazards from roofs greater than six feet; in addition, employees engaged in roofing activities may be protected by warning line and/or safety monitoring systems.

The Bureau of Labor Statistics [1] reports there are approximately 102,000 roofers employed in the construction industry. To account for other construction employees that may also work on roofs, such as laborers, helpers, carpenters, and other workers, this figure was increased by 50 percent. Thus, the estimated number of employees affected by the fall protection requirements for work on roofs is about 150,000.

For buildings where guardrails along the roof perimeter are not provided, the use of personal fall arrest systems is expected to be a widespread method of providing fall protection to employees working on roofs. They are easy to use and maintain, and their reusability and relatively low cost makes them cost-effective. Many different types of these systems are

commercially available, and they can be adapted to a variety of situations. Personal fall arrest systems are currently used to protect employees from fall hazards encountered in roofing operations and other types of construction work.

The use of warning line and safety monitoring systems would generally involve a lower cost than that associated with personal fall arrest systems. To the extent that under revised subpart M some employers may choose the option of using these systems in lieu of other fall protection systems, the actual cost of compliance with revised Subpart M may be lower than that estimated here.

A complete standard personal fall arrest system, designed for work on roofs as well as other areas, and consisting of an anchorage bracket and bolts, a 25 foot line, a rope-grab device, and a safety harness, would cost about \$250. Approximately 80 percent of affected employees may need to be provided with such a system, considering current use of such systems, use of other fall arrest systems, and that not every employee would need to use a personal fall arrest system every day.

The average expected life span of a personal fall arrest systems is expected to be about three years. Some components, such as certain types of rope, may need to be replaced more frequently; other components, such as "dee" rings or rope grab devices (generally more expensive parts of the system), may have longer average life spans. The annualized cost of such a system,

using an interest rate of 10 percent, is calculated to be about \$100.

Anchorage points are not always readily transportable and may have to be newly established or adapted on some buildings; a average cost of \$50 per year for each personal fall arrest system used is added to cover additional costs, such as for bolts, brackets, or cables, associated with the installation of anchorage points in unique circumstances. For example, this cost may represent an added \$500 expenditure at a work site involving 10 employees, to provide an appropriate personal fall arrest system for certain special circumstances.

Thus, the total annual cost associated with providing personal fall arrest systems for work on roofs would be \$18 million.

On some roofs, fall protection may be provided through the use of guardrail systems or safety nets. These systems may prove to be more cost-effective in some cases, depending on the duration and nature of the job and the number of employees involved. Some roofs may already be equipped with guardrails, or the use of personal fall arrest systems may not be the most practical solution in all cases.

OSHA estimates that about 1 percent of the commercial buildings on which work on roofs is performed would be equipped with guardrails or safety nets each year to protect employees working on roofs. This represents about 2,100 buildings annually, assuming that on average, 5 percent of buildings have

construction work done each year on the roof. Many additional buildings may currently have permanently installed guardrail systems, anchorage systems, personal fall arrest systems, or have otherwise provided protection from fall hazards on roofs.

Materials and labor for the installation of a guardrail system designed for fall hazards from roofs would cost about \$5 per linear foot on average, while the rental of a perimeter personnel safety net system would cost about \$20 per linear foot for three months. A typical building of 10,000 square feet per floor may have 400 feet of roof perimeter. A guardrail system would have an estimated total cost of \$2,000; the safety net system would cost about \$8,000.

The use of guardrails is likely to be more common than the use of safety nets, due to their generally lower cost and greater adaptability. Assuming that the ratio of roofs using guardrails to roofs using nets is three to one, then the average cost per building for which these systems are used would be \$3,500 $((\$2,000 * 3 + \$8,000 * 1) / 4 = \$3,500)$.

Thus, the total annual cost associated with providing guardrail systems and safety net systems for work on roofs would be \$7.35 million.

The total annual cost of providing fall protection for work on roofs thus amounts to \$25.35 million.

In comparison to existing subpart M, the revised standard sets more comprehensive fall protection requirements and is applicable to a wider range of construction activities. Both the

existing and revised standards require protection from falls of six feet or more from open-sided floors and platforms. However, under the revised standard, employees on any walking or working surface with a potential fall of six feet or more must be protected. Whereas the existing standard specifies the use of guardrails, the revised standard provides for the use of guardrails, safety nets, or personal fall arrest systems, and other systems in special circumstances.

It is difficult to evaluate the number of circumstances in construction that would involve an employee potentially exposed to a fall of six feet or more. In most cases, a guardrail can be erected as required by the existing standard; for situations where the use of standard guardrails does not represent an appropriate solution, most of these are addressed by other standards developed specifically for those circumstances, such as falls from ladders, scaffolds and other suspension devices, and vehicles, or during steel erection operations for buildings.

However, in some construction environments there may be walking or working surfaces with potential fall hazards of six feet or more for which the use of guardrails is not appropriate or practical. In these cases, a safety net or personal fall arrest system would need to be employed. Such equipment is already widely used in the construction industry. Furthermore, existing OSHA standards already compel employers to protect employees from fall hazards where guardrails would be infeasible.

As a result of the revised rule, it is estimated that an additional 10,000 construction workers may need to be provided with a fall protection system. This figure represents approximately one out of every four hundred construction workers. Specific circumstances in which the utilization of fall protection systems may increase over current rates of use would include work at leading edges, at hoist areas not equipped with guardrails, above dangerous equipment, and during precast concrete erection. The increased use of fall protection systems may also be applied to a variety of diverse construction activities involving potential fall hazards, including residential, commercial, and other building construction, and nonbuilding construction such as bridges, elevated highways, harbor facilities, and pipelines.

The annual cost associated with providing a personal fall arrest system for each of 10,000 construction workers would be about \$150 per employee, or a total expenditure of \$1.5 million. This estimate captures the general magnitude of the costs associated with compliance with the revised standard; the specific approach and solution for providing fall protection would differ for each construction project depending upon the nature of the site and the work involved.

As noted in Chapter IV, there circumstances where careful planning of work or the use of alternative work practices or construction methods will obviate the need for fall protection; for example, such changes may allow work to be performed at grade

rather than at elevation. Alternative fall protection measures (such as controlled access zones, fall protection plans, or safety monitoring systems) are included under revised subpart M for particular circumstances. In most of these situations, the average cost for employers would be less than the cost of providing conventional fall protection systems for all affected employees.

For overhand bricklaying operations, the requirements of the existing standard 1926.500(d) are not directly applicable because a guardrail could impede the work operation. This situation is addressed by the revised standard, which provides that employees shall be protected by guardrail systems, safety net systems, or personal fall arrest systems, or they shall work in a controlled access zone. Given these choices, OSHA anticipates that most employers will use a controlled access zone for overhand bricklaying operations due to its relatively low cost, ease of use, and flexibility.

Under the revised standard, a controlled access zone system may have to be implemented for an estimated 3,000 buildings for which overhand bricklaying is done each year. The controlled access zone system consists of a line and portable stanchions and would protect the area in which work was being performed; the system could be moved from floor to floor as work progresses. A 150 foot system will generally be adequate for this purpose and could be expected to last two years. Using a cost of \$200 for equipment for each system, the annualized unit cost for materials

would be \$115. The total annualized cost for materials would be an estimated \$345,000.

In addition, the average labor time needed to set up the control zone is estimated to be one hour per floor. With an average of six floors per building and a labor cost of \$20 an hour, the total annual labor cost for these control zones would be \$360,000.

The total annualized cost for materials and labor associated with control zone systems for overhand bricklaying operations would be \$705,000.

The revised standard includes requirements for protection from falling objects. These requirements apply only where falling object hazards are present. Employers should be able to avoid the creation of falling object hazards without incurring additional costs by keeping objects that may fall far enough away from the edge of a higher level so that those objects would not go over the edge if they were accidentally displaced. Alternatively, where guardrail systems are used at an edge to protect employees from falls, these systems can simultaneously serve to prevent potential falling object hazards.

Revised subpart M includes a new requirement that personnel safety nets be inspected at least weekly. Approximately 15,000 such safety nets are in daily use on construction sites, and the length of time required for a typical inspection is estimated to be 15 minutes. With a cost of labor of \$20 an hour, the total

annual cost of compliance with this provision would be \$3.90 million.

Under the revised standard, safety net installations are required to be drop-tested at least every six months or, under special circumstances, required to be certified. The estimated average cost of labor, equipment, and materials for each drop test is \$50, and the total cost of conducting 30,000 drop tests each year would be \$1.5 million. The certification of a safety net system would not cost more than conducting a drop test, since those responsible for the installation of the safety net system should also be able to provide the necessary certification of its integrity. Thus, the total annual cost of compliance with the provisions for drop-testing or certification is an estimated \$1.50 million.

Beginning on January 1, 1998, the revised standard prohibits the use of body belts as part of a personal fall arrest system. The use of body harnesses is already quickly replacing the use of body belts in most applications. This trend indicates that many employers prefer to use body harnesses instead of body belts for a variety of reasons. Technological innovations over the last decade have made body harnesses lighter, easier to use, and more comparable in price to body belts. OSHA expects this trend to continue. The average life span of body belts is about three years; the revised standard provides sufficient notice to employers and manufacturers to allow a conversion to body harnesses without requiring usable equipment to be disposed of

and without imposing any significant additional costs to employers.

Similarly, beginning on January 1, 1998, the revised standard prohibits the use of non-locking snaphooks with personal fall arrest systems or positioning device systems. Non-locking snaphooks are already widely recognized as being less safe than locking snaphooks, and most personal fall arrest systems are currently sold with locking snaphooks. In allowing three years to complete the transition already underway, the provisions in revised subpart M eliminating the use of non-locking snaphooks should not result in any significant additional costs to affected establishments.

Another notable change in the revised standard is the expanded training requirement. The existing standard already requires extensive training for employees engaged in built-up roofing work under 1926.500(g)(6), and existing training requirements in 1926.21(a) and (b) require the employer to train all employees to recognize and avoid unsafe conditions and to be familiar with the standards applicable to their work environment. Revised subpart M outlines how this applies to fall hazards in construction.

The training provisions in revised subpart M are intended to clarify existing general requirements and to provide direction regarding the training necessary in this area. OSHA recognizes that by making these requirements more explicit in the revised standard, some employers will need to spend additional resources

to achieve compliance. Part of the incremental training cost would reflect the fact that provisions on work practices have been added in the revised standard, and that training is to be conducted by a competent person.

Although virtually every construction worker may potentially be exposed to a fall of six feet or more, most employees are already provided with sufficient training or have gained the necessary knowledge through experience or apprenticeship programs. OSHA estimates that additional training by a competent person will be needed each year for approximately one million employees (about 25 percent of the construction work force), and that on average, approximately four employees would be trained at a time by a supervisor.

The training provisions in revised subpart M are comprehensive and detailed, but they are required "as applicable." Thus, not every employee would need to be instructed about all aspects of fall prevention and fall protection systems. Further, a certain degree of training is provided already, regardless of any standard, to ensure that employees are able to fulfill their duties. It is assumed that fifteen minutes of incremental training would be dedicated to issues related directly to requirements in the revised subpart M. With average labor costs of \$20 an hour for construction workers and \$25 an hour for supervisors, the total annual costs of the training requirements is estimated to be \$6.56 million.

Provisions in the revised standard regarding criteria for fall protection systems are newly codified as OSHA requirements. These provisions basically codify minimum safety criteria that have already been widely accepted by safety professionals and industry consensus organizations. Equipment and materials currently manufactured, sold, and used generally meet the criteria of the revised standard. The effect of the requirements will be to make these criteria legally binding for all construction employers, and to prevent the use of substandard fall protection systems from being acceptable under the law. The costs associated with the criteria that fall protection systems must meet are incorporated into the costs imposed by the requirements to use such fall protection systems.

Costs of Compliance with the Existing Standard

For purposes of estimating the total costs of full compliance with all requirements of the revised standard, from a baseline of current practices, the costs of achieving full compliance with provisions of the existing standard are estimated. The costs identified in this section are associated with requirements that already exist and would remain in effect under revised subpart M. These costs basically represent estimates of the degree of noncompliance with current standards within the scope of revised subpart M. Costs for specific provisions are discussed below and a summary of the costs is presented in Table V-2.

The main set of violations to the fall protection requirements in subpart M involves the failure to install guardrails on open-sided floors and platforms six or more feet above adjacent levels, and around floor openings and floor holes.

The preliminary regulatory impact analysis (PRIA) [2] presented a methodology that was used to develop estimates of the total perimeter footage in construction for which guardrails would be used to protect employees from falls from open-sided floors and platforms. The estimates were based on the number of different types and sizes of buildings constructed, and included estimates of the extent of current compliance with the existing perimeter guarding requirements.

The compliance costs estimated in the PRIA were based on a total of almost 90,000 buildings constructed annually (excluding single-family housing); the total length of floor perimeter for these buildings (excluding the first floor) was estimated to be 68.3 million feet.

The Department of Commerce reported in the 1993 Statistical Abstract of the United States [3] that, on average, about 76,000 commercial buildings are constructed each year (excluding industrial and residential buildings and single-family houses). The mean size of these buildings is approximately 15,000 square feet. The total length of floor perimeter for these buildings, excluding the first floor, ranges from an estimated 46 million feet (assuming that the buildings have an average of 3 floors, each 50 feet by 100 feet), to an estimated 76 million feet

(assuming that the average building has six floors, each 50 feet by 50 feet).

For purposes of estimating the costs of full compliance with existing subpart M requirements, OSHA estimated that 70 million feet of floor and platform perimeter would need to be guarded each year, and that guardrails are currently not provided for 10 percent of this length. Although the rate of compliance may be higher than 90 percent during building construction, these estimates also include an allowance for the use of and lack of guardrail systems during nonbuilding construction work. At a cost of \$3 per foot to construct a standard perimeter guardrail system, the total incremental annual cost associated with full compliance with this requirement would be \$21 million.

Perimeter guardrails are not expected to be necessary during the construction of single-family houses or townhouses. The floors of these structures are usually enclosed, preventing the need for installing guardrails. In addition, where the installation, use, and removal of fall protection systems would present greater or increased exposure to hazards, these systems would not be required to be implemented.

Another area frequently cited for violations under existing subpart M is the guarding of floor holes and floor openings. As in the PRIA, the perimeter length of floor openings and holes requiring guardrails or covers was estimated at 10 percent of the total length of floor perimeter; the rate of noncompliance in these areas was estimated at 20 percent. Of the unguarded holes

and openings, 75 percent would be guarded with covers at a cost of \$1.00 per foot, and 25 percent would be guarded with guardrails at a cost of \$3.00 per foot. Thus, the total annual cost of providing protection at floor openings and holes that are currently unguarded would be an estimated \$2.1 million.

Violations to a variety of other miscellaneous provisions in existing subpart M also need to be addressed to estimate costs of full compliance with this standard. OSHA inspection data for fiscal year 1993 show that about 20,300 inspections were carried out in the construction industry. Excluding violations of provisions for the categories discussed above, there were a total of 498 violations cited under subpart M. Among the provisions included in this category are those addressing fall protection on runways and walkways, fall protection for wall openings, and specifications for the proper construction of guardrail systems and covers.

OSHA estimates that 2 percent of construction sites may not be in full compliance with existing subpart M. This estimate takes into account the nonrandomness of inspections, the varying number of employers present per job site, and other factors such as possible multiple violations per inspection and the number of job sites worked on per employer per year.

Approximately 1.73 million construction projects are undertaken each year [4]. At an average cost of \$200 for each construction site in violation of one or more provisions, the total annual cost of compliance for the industry would be \$6.92 million.

REFERENCES

1. U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings, Volume 40, Number 1, January 1993.
2. Preliminary Regulatory Impact and Regulatory Flexibility Assessment of Subpart M - Fall Protection (29 CFR Part 1926.500-.503). OSHA, Office of Regulatory Analysis, Washington, D.C., 1985.
3. U.S. Department of Commerce. Bureau of the Census. Statistical Abstract of the United States 1993. 113th Edition. Washington, D.C., 1993.
4. Eastern Research Group, "Analysis of a Legislative Proposal for Registration of Construction Projects," February 19, 1991, Table 1.

VI. ECONOMIC IMPACTS

Compliance with the requirements of revised subpart M is not expected to produce any significant adverse economic impacts. The costs that are imposed by the regulation should be a minimal burden on construction establishments.

Expenditures required for compliance will depend on the size and nature of individual projects and will be incurred as the work on the projects progresses. Furthermore, construction employers should be able to anticipate any costs associated with compliance with revised subpart M prior to the commencement of each project. This means that compliance costs can be incorporated in cost estimates and in bids for projects. The revenue from each project would cover the compliance costs. Compliance with the safety requirements would have a minimal effect on construction costs and would not involve large up-front investments or increases in overhead.

Supplementary fall protection systems for work on roofs could be provided as needed, limiting initial outlays. The costs per establishment would be proportional to the number of workers employed and revenues earned; a typical establishment may need additional fall protection systems for six employees and would incur an estimated annual cost of less than \$1,000. According to the 1987 Census of Construction Industries, the average dollar value of business done by construction establishments is approximately \$960,000.

Estimated costs of compliance with revised subpart M for roofing contractors would not involve significant adverse impacts. The total dollar value of business done by roofing contractors is approximately \$8.8 billion annually, and the total estimated costs of compliance with new requirements in subpart M are less than \$40 million. Thus, the costs of compliance with this final standard represent less than 0.5 percent of the revenues of the roofing industry alone.

For establishments in other sectors of the construction industry, and for the construction industry as a whole, the economic impacts associated with the revision of subpart M would be even smaller. The estimated costs of compliance represent less than 0.01 percent of revenues and less than 0.05 percent of payroll in this industry. Thus, compliance with revised subpart M is considered to be economically feasible.

Current practices in the construction industry indicate that the requirements of revised subpart M can generally be met without significant hardship. Many employers already comply with those requirements without, presumably, imposing substantial disadvantages on themselves. OSHA has found that noncompliance tends to reflect negligence on the part of a limited number of employers rather than an inability to meet the requirements due to technological or economic feasibility considerations.

The total costs of compliance represent less than 0.02 percent of the net value of construction. Since all construction in the United States would be subject to the same

regulations, no competitive disadvantages with regard to international trade are projected. Costs are expected to be passed through as an increase in the cost of construction, and the effect on profits and prices should be negligible. On the whole, the costs of construction for society would actually decrease as fewer accidents would mean less lost time and wages and fewer medical and legal resources necessary for a given amount of construction.

The estimated savings to society attributable to the prevention of injuries and fatalities would far outweigh the costs of preventing these incidents. According to the National Safety Council, the total costs associated with occupational injuries and deaths in 1992 were \$115.9 billion, or an average cost of over \$15,000 per case. This estimate includes wage and productivity losses, medical costs, administrative expenses, and other costs associated with accidents. The estimated benefits anticipated from the revision of subpart M include unquantifiable reductions in pain and suffering, plus savings of over \$200 million annually.

REGULATORY FLEXIBILITY ANALYSIS

Pursuant to the Regulatory Flexibility Act of 1980 (5 U.S.C. 601 et seq.), OSHA has made an assessment of the impact of the revised standard and has concluded that it would not have a significant impact upon a substantial number of small entities.

The controlling consideration for a regulatory flexibility analysis is whether the standard would impose significant economic impacts on a substantial number of small entities. "Significance" is determined by the effect upon profits, market share, and an entity's financial viability. Accordingly, OSHA has evaluated the revised standard's effect upon small entities relative to its effect upon large entities. In particular, OSHA has considered whether the standard would have a relatively greater negative effect upon small entities than it would have upon large entities, thereby putting small entities at a competitive disadvantage. Where OSHA finds disproportionate effects, the Agency considers whether there are ways to minimize those effects without increasing the risk to employees.

Insofar as the costs of compliance are proportional to firm size and are insignificant to small firms, there is no significant differential effect upon small firms relative to that upon large firms. On the other hand, where compliance imposes large absolute costs (typically capital equipment costs), small entities may have more difficulty than large entities in obtaining financing, resulting in a disproportionate burden on small firms. The changes to subpart M, however, require minimal capital expenditures and generally impose costs that are proportional to firm size. Furthermore, these costs would be a minimal component of the overall costs of the structures being built. As a result, small entities would not be put at a

competitive disadvantage in relation to large entities due to the costs of complying with revised subpart M.

The most significant new requirements are for fall protection during work on roofs. According to the Census of Construction Industries, the dollar value of business done by roofing contractor establishments with payrolls was over \$8.8 billion dollars in 1987. The estimated costs of compliance for roofing work represent less than 0.5 percent of these revenues. For establishments other than roofing contractors, the ratio of compliance costs to revenues would be even smaller.

Thus, OSHA has concluded that this revised standard would not have a significant adverse impact upon a substantial number of small entities.

OSHA has included non-mandatory appendices as part of the regulation to help improve compliance with the standard and reduce the potential for misunderstanding. These appendices will also help to minimize impacts on small firms by significantly reducing the effort needed to develop a compliance strategy.

IMPACT UPON INTERNATIONAL TRADE

OSHA also determined that neither full compliance with the revised standard nor full compliance with the existing standard would have any measurable impact upon international trade. The final products being constructed are for internal U.S. consumption and the types of safety equipment used would not affect exports, imports, or international competitiveness. Thus,

international trade would be unaffected by the revisions to subpart M.

ENVIRONMENTAL IMPACTS

Revisions to subpart M have been reviewed in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321, et seq.), the regulations of the Council on Environmental Quality (CEQ) (40 CFR Part 1500 et seq.), and OSHA's DOL NEPA procedures (29 CFR Part 11). As a result of this review, OSHA has determined that revised subpart M will have no significant effect on air, water, or soil quality, plant or animal life, use of land, or other aspects of the environment.



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